

## **APPENDIX C**

### **1. Commercial Fisheries**

#### **Map Distributions**

For urchins, spiny lobsters, flatfish, sea cucumbers, sculpin & bass, and sharks, we used the sample distributions of catch by the 1 by 1 minute blocks obtained from the fishermen through a contract with Sea Foam Enterprises (Dr. Craig Barilotti). These distributions are normalized to equal 100 percent across all blocks. We then calculated the 1996 – 1999 Average Annual Ex Vessel Values for each species/species group (see our list of species in each species group) and each of the 22 California Department of Fish and Game (CDFG) blocks that define the Channel Islands National Marine Sanctuary (CINMS). The totals across all 22 blocks are then distributed to the 1 by 1 minute blocks.

For rockfishes, crab, and prawns, the sample distributions were not completely adequate. For rockfish, we had good distribution information west of 119 Degrees 50' West Longitude (see rockfish map). The sample contained no information east of this point. So we used the sample distribution and the CDFG 10 block totals for the western area to derive the 1 by 1 mile distribution on the western half. For the eastern half, we used the CDFG 10 by 10 mile total for each block and distributed them equally within the block to the 1 by 1 mile blocks included in the Exclusion Zone maps. The CDFG 10 by 10 mile block data confirm that our sample is correct in maintaining that little of the rockfish catch comes from the eastern half. The 1996-1999 Average Annual Rockfish ex vessel value was \$507,758 for the western half and \$41,561 for the eastern half.

For crab, we followed the same procedure as for rockfish for the western half. For the eastern half, Exclusion Zone information was not available. We distributed the CDFG 10 by 10 mile block totals to the 1 by 1 mile blocks within each 10 by 10 mile block to those 1 by 1 mile blocks within three miles from shore (the pattern on the western half). As with rockfish, the CDFG data confirm that catches from the eastern half is relatively small. The 1996-1999 Average Annual ex vessel value for the western half was \$304,029 and \$39,565 for the eastern half.

For prawn, there were only three fishermen in our sample. We used the CDFG 10 by 10 mile block totals and distributed these totals within the 10 by 10 mile blocks evenly to the 1 by 1 mile blocks included in the Exclusion Zone maps. Prawn distributions extend out to the edges of the CINMS and into blocks outside our 22 block definition (see map). We accounted for this by taking the data from CDFG block 690 and distributing its total to the 1 by 1 mile Exclusion Zone blocks in 690, 671 and 672. Also, data from CDFG block 711 was distributed to the 1 by 1 mile blocks in 711 and 730.

For squid, wetfish (Anchovies & Sardines and Mackerel) and tuna, we use the sample distributions obtained from the squid/wetfish fishermen through a contract with Dr. Carrie Pomeroy of UC-Santa Cruz. These distributions were normalized to 100 percent across the 1 by 1 mile blocks. We then calculated the 1996 – 1999 Average Annual Ex Vessel Values for each species/species group (see our list of species in each species

## APPENDIX C

group) and each of the 22 the California Department of Fish and Game (CDFG) blocks that define the Channel Islands National Marine Sanctuary (CINMS). The totals across all 22 blocks are then distributed to the 1 by 1 mile blocks.

Please Note: Our current estimates for squid ex vessel values are still preliminary. From CDFG, we estimate the 1996-1999 Annual Average to be around \$11 million, while PacFIN estimates this at about \$13 million. The difference has to do with interpolation of missing values where pounds of landing are reported. We are still evaluating the PacFIN method for interpolating missing value. Most of the current disagreement is for 1996 values. We hope to have this resolved before we analyze boundary alternatives.

### **Species/Species Groups Not Mapped at the 1 by 1 mile Resolution or Not Mapped**

The following table summarizes the other species/species groups either not mapped at the 1 by 1 mile block resolution or not mapped at all and the percent of ex vessel value each species/species group accounted for over the 1996-1999 period. All these species/species groups accounted for less than 1.5 percent of the total ex vessel value from the CINMS, including abalone. Abalone has not been commercially harvested since 1997 in the CINMS. Excluding abalone, these species/species groups accounted for only a little over one half of one percent of the total ex vessel value from the CINMS.

Table C.1.

Species/Species Group	1996-1999 Avg. Value	Percent of CINMS
Abalone	178,027	0.878273 mapped at 10 by 10 mile
Swordfish	39,090	0.192845 mapped at 10 by 10 mile
Roundfish	33,262	0.164094 mapped at 10 by 10 mile
Other	22,990	0.113418 mapped at 10 by 10 mile
Yellowtail	6,891	0.033996 mapped at 10 by 10 mile
Shrimp	5,813	0.028678 mapped at 10 by 10 mile
Mussels, Snails	4,694	0.023157 mapped at 10 by 10 mile
Salmon	1,411	0.006961 mapped at 10 by 10 mile
Rays & Skates	1,164	0.005742 mapped at 10 by 10 mile
Surf Perch	695	0.003429 not mapped
Grenadiers	211	0.001041 not mapped
Octopus	196	0.000967 not mapped
<b>Total</b>	<b>294,444</b>	<b>1.452601</b>
<b>Total, Excluding Abalone</b>	<b>116,417</b>	<b>0.574328</b>

## APPENDIX C

### Quality Assessment

We have attempted to provide a quality assessment for each species/species group map. We also have attempted to provide information to assess how representative our sample would be of the population of fishing operations in the CINMS.

There are significant differences in the distributions of catch between the population of fishing operations and our samples for each species/species groups. So without sample weighting, extrapolating sample means (averages) to derive population totals would not be advisable. We are also evaluating the impact this might have on socioeconomic profiles. However, we are more confident in our spatial distributions for the maps. Still some maps are better than others. To help assess the quality of the maps, we provide the sample size in parentheses, the CDFG control totals for the 1996-1999 Annual Averages, and what percent of that total our sample accounted for. As you will see from the population distributions of fishing operations and ex vessel value, in many cases, a small percent of the fishing operations account for a large percentage of the ex vessel value. Overall our two samples (Barilotti and Pomeroy) accounted for about 79 percent of the ex vessel value of catch from the CINMS for the 1996-1999 period (excluding Kelp). So overall, we are highly confident that we are capturing the commercial fishing values.

For each mapped distribution of species/species groups, we provide the population distributions of the number of fishing operations that operated in the Channel Islands National Marine Sanctuary (CINMS) and the ex vessel value (amount received by fishermen) from catch in the CINMS. The data is from the California Department of Fish and Game (CDFG) and is reported by fisherman and CDFG 10 by 10 mile blocks. We use 22 of the CDFG blocks to define the CINMS.

For comparison purposes, we also provide the sample distributions for the number of fishing operations and their ex vessel value from the CINMS.

The population distributions from CDFG were for 1999 and were gathered in the spring of 2000. These numbers were preliminary and the totals don't agree with the control totals you will find in a summary table included in you package. The differences in the totals are not significant.

## APPENDIX C

Table C.2. Population  
All Species in Channel Islands National Marine Sanctuary - 22 Block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	737	100.00	36,718,444	100.00
GE \$500,000	19	2.58	12,809,041	34.88
GE \$100,000	78	10.58	25,866,209	70.44
GE \$50,000	141	19.13	30,110,099	82.00
GE \$20,000	268	36.36	34,469,665	93.88
LT \$20,000	469	63.64	2,248,779	6.12
LT \$10,000	389	52.78	1,127,487	3.07
LT \$5,000	286	38.81	367,003	1.00
LT \$1,000	170	23.07	75,105	0.20

**Note that, in 1999, 78 or 10.58 percent of the fishing operations accounted for 70.44 percent of the ex vessel revenue. The Barilotti sample (all species/species groups except squid, wetfish and tunas) accounted for about 25 percent of the 1996-1999 Average Annual Ex Vessel Value. The Pomeroy sample (squid, wetfish and tunas) accounted for 95 percent of squid, 84.5 percent of wetfish and 13.62 percent of tuna. But across all three species/species groups, the Pomeroy sample accounts for 54.12 percent of the total 1996-1999 value. The Barilotti sample included 59 fishing operations and the Pomeroy sample included 37 fishing operations for a total of 96 fishing operations or 13 percent of all CINMS fishing operations which accounted for about 79 percent of the total ex vessel value in the CINMS.**

GT stands for Greater Than.

GE stands for Greater than or Equal to.

LT stands for Less Than.

LE stands for Less than or Equal to.

## APPENDIX C

Table C.3.

Commercial Fishing Ex Vessel Value for the CDFG 22 Block Definition of the CINMS

Species/Species Group	Sum of 1988 - 1999		1999		Avg. 1996-1999		Rank	Rank
	Value \$	Percent	Value \$	Percent	Value \$	Percent	1999	1996-1999
Squid	58,414,283	40.79	26,558,813	72.31	11,249,837	55.42	1	1
Urchins	56,515,080	39.46	5,963,876	16.24	5,265,233	25.94	2	2
Spiny Lobster	6,774,501	4.73	952,991	2.59	922,098	4.54	3	3
Rockfishes	4,659,502	3.25	549,446	1.50	549,319	2.71	5	5
Prawn	3,558,714	2.48	743,159	2.02	703,186	3.46	4	4
<b>sub-total (TOP 5)</b>	<b>129,922,080</b>	<b>90.72</b>	<b>34,768,285</b>	<b>94.66</b>	<b>18,689,673</b>	<b>92.07</b>		
Abalone	2,544,275	1.78	47	0.00	178,027	0.88	n/a	11
Crab	2,378,003	1.66	313,289	0.85	343,664	1.69	8	6
Anchovy & Sardines	1,378,517	0.96	548,944	1.49	234,367	1.15	6	8
CA Sheephead	1,326,089	0.93	153,147	0.42	235,928	1.16	10	7
Flatfish	1,105,209	0.77	324,685	0.88	183,871	0.91	7	10
<b>sub-total (6-10)</b>	<b>8,732,093</b>	<b>6.10</b>	<b>1,340,112</b>	<b>3.65</b>	<b>1,175,857</b>	<b>5.79</b>		
<b>Total TOP 10</b>	<b>138,654,173</b>	<b>96.82</b>	<b>36,108,397</b>	<b>98.31</b>	<b>19,865,530</b>	<b>97.86</b>		
<b>Total TOP 8, excluding Abalone</b>	<b>136,109,898</b>	<b>95.04</b>	<b>36,108,350</b>	<b>98.31</b>	<b>19,687,503</b>	<b>96.98</b>		
<b>Total All Species</b>	<b>143,209,999</b>	<b>100.00</b>	<b>36,730,499</b>	<b>100.00</b>	<b>20,299,548</b>	<b>100.00</b>		
Sea Cucumbers	737,031	0.51	267,842	0.73	167,700	0.83	9	12
Mackerel	550,216	0.38	59,921	0.16	67,119	0.33	12	13
Sculpin&Bass	568,354	0.40	88,547	0.24	60,327	0.30	11	14
Tuna	958,499	0.67	53,694	0.15	205,884	1.01	13	9
Swordfish	824,731	0.58	21,472	0.06	39,090	0.19	17	15
Shark	373,328	0.26	41,638	0.11	34,751	0.17	14	16

## APPENDIX C

Table C.4. Species Included in Each Species Group for Commercial Fisheries Analyses

Species Group Code	Species Group Name	CDFG Species Code	Common Name	Scientific Name
1	Tuna	1	Tuna, yellowfin	Thunnus albacares
		2	Tuna, skipjack	Katsuwonus pelamis
		3	Bonito, Pacific	Sarda chilienis
		4	Tuna, bluefin	Thunnus thynnus
		5	Tuna, albacore	Thunnus alalunga
		6	Tuna, unspecified	Scombridae
		8	Tuna, bigeye	Thunnus obesus
		9	Tuna, skipjack, black	Euthynnus lineatus
2	Mackerel	19	Mackerel, bullet	Auxis rochei
		50	Mackerel, unspecified	Scomber / Trachurus
		51	Mackerel, Pacific	Scomber japonicus
		55	Mackerel, jack	Trachurus symmetricus
3	Sharks	96	Shark, white	Carcharodon carcharias
		97	Shark, bigeye thresher	Alopias superciliosus
		98	Shark, pelagic thresher	Alopias pelagicus
		150	Shark, unspecified	Selachii spp.
		151	Shark, shortfin mako	Isurus oxyrinchus
		152	Shark, spiny dogfish	Squalus acanthias
		153	Shark, leopard	Triakis semifasciata
		154	Shark, brown smoothhound	Mustelus henlei
		155	Shark, thresher	Alopias vulpinus
		156	Shark, basking	Cetorhinus maximus
		158	Shark, smooth hammerhead	Sphyrna zygaena
		159	Shark, soupfin	Galeorhinus zyopterus
		161	Shark, sixgill	Hexanchus griseus
		162	Shark, sevengill	Notorynchus cepedianus
		163	Shark, swell	Cephaloscyllium ventriosum
		165	Shark, Pacific angel	Squatina californica
		167	Shark, blue	Prionace glauca
		169	Shark, horn	Heterodontus francisci
		179	Shark, gray smoothhound	Mustelus californicus
4	Rays & Skates	170	Ray, unspecified	Rajiformes
		171	Ray, bat	Myliobatis californica
		172	Ray, Pacific electric	Torpedo californica
		174	Guitarfish, shovelnose	Rhinobatos productus
		175	Skate, unspecified	Rajidae
5	Rockfishes	245	Rockfish, cowcod	Sebastes levis
		246	Rockfish, copper (whitebelly)	Sebastes caurinus
		247	Rockfish, canary	Sebastes pinniger
		249	Rockfish, vermilion	Sebastes miniatus
		250	Rockfish, unspecified	Sebastes spp.

## APPENDIX C

Table C. 4. (continued)

Species Group Code	Species Group Name	CDFG Species Code	Common Name	Scientific Name
5	Rockfishes <sup>1</sup> (continued)	251	Rockfish, black-and-yellow	<i>Sebastes chrysomelas</i>
		252	Rockfish, black	<i>Sebastes melanops</i>
		253	Rockfish, bocaccio	<i>Sebastes paucispinis</i>
		254	Rockfish, chilipepper	<i>Sebastes goodei</i>
		255	Rockfish, greenspotted	<i>Sebastes chlorostictus</i>
		256	Rockfish, starry	<i>Sebastes constellatus</i>
		257	<i>Rockfish, darkblotched</i>	<i>Sebastes crameri</i>
		258	Rockfish, China	<i>Sebastes nebulosus</i>
		259	Rockfish, yellowtail	<i>Sebastes flavidus</i>
		260	Rockfish, California	<i>Scorpaena guttata</i>
		261	Cabazon	<i>Scorpaenichthys marmoratu</i>
		262	Thornyheads	<i>Sebastolobus</i> spp.
		263	Rockfish, gopher	<i>Sebastes carnatus</i>
		264	Rockfish, pinkrose	<i>Sebastes simulator</i>
		265	Rockfish, yelloweye	<i>Sebastes ruberrimus</i>
		267	Rockfish, brown	<i>Sebastes auriculatus</i>
		268	Rockfish, rosy	<i>Sebastes rosaceus</i>
		269	Rockfish, widow	<i>Sebastes entomelas</i>
		270	Rockfish, splitnose	<i>Sebastes diploproa</i>
		651	Rockfish, olive	<i>Sebastes serranoides</i>
		652	Rockfish, grass	<i>Sebastes rastrelliger</i>
		653	<i>Rockfish, pink</i>	<i>Sebastes eos</i>
		654	Rockfish, greenstripped	<i>Sebastes elongatus</i>
		655	Rockfish, copper	<i>Sebastes caurinus</i>
		657	Rockfish, flag	<i>Sebastes rubrivinctus</i>
		658	Rockfish, treefish	<i>Sebastes serripes</i>
		659	Rockfish, kelp	<i>Sebastes atrovirens</i>
		660	<i>Rockfish, honeycomb</i>	<i>Sebastes umbrosus</i>
		661	Rockfish, greenblotched	<i>Sebastes rosenblatti</i>
		662	Rockfish, bronzespotted	<i>Sebastes gilli</i>
		663	Rockfish, bank	<i>Sebastes rufus</i>
		664	Rockfish, rosethorn	<i>Sebastes helvomaculatus</i>
		665	Rockfish, blue	<i>Sebastes mystinus</i>
		666	<i>Rockfish, squarespot</i>	<i>Sebastes hopkinsi</i>
		667	Rockfish, blackgill	<i>Sebastes melanostomus</i>
		668	<i>Rockfish, stripetail</i>	<i>Sebastes saxicola</i>
		669	Rockfish, speckled	<i>Sebastes ovalis</i>
		670	<i>Rockfish, swordspine</i>	<i>Sebastes ensifer</i>
		671	<i>Rockfish, calico</i>	<i>Sebastes dallii</i>
		672	<i>Rockfish, shortbelly</i>	<i>Sebastes jordani</i>
		673	<i>Rockfish, chameleon</i>	<i>Sebastes phillipsi</i>
		674	Rockfish, aurora	<i>Sebastes aurora</i>
		675	Rockfish, redbanded	<i>Sebastes babcocki</i>
		678	Thornyhead, longspine	<i>Sebastolobus altivelis</i>
		679	Thornyhead, shortspine	<i>Sebastolobus alascanus</i>

## APPENDIX C

Table C. 4. (continued)

Species Group Code	Species Group Name	CDFG Species Code	Common Name	Scientific Name
5	Rockfishes (continued)	956	Rockfish, group bocaccio/chili	Sebastes/group
		957	Rockfish, group bolina	Sebastes/group
		958	Rockfish, group deepwater reds	Sebastes/group
		959	Rockfish, group red	Sebastes/group
		960	Rockfish, group small	Sebastes/group
		961	Rockfish, group rosefish	Sebastes/group
		962	Rockfish, group gopher	Sebastes/group
		970	Rockfish, quillback	Sebastes maliger
		971	<i>Rockfish, group canary/vermili</i>	<i>Sebastes/group</i>
		972	<i>Rockfish, group black/blue</i>	<i>Sebastes/group</i>
6	Sculpin & Bass	272	Sculpin, staghorn	Leptocottus armatus
		273	<i>Sculpin, yellowchin</i>	<i>Icelinus quadriseriatus</i>
		275	Bass, rock	Paralabrax spp.
		276	<i>Bass, spotted sand</i>	<i>Paralabrax maculatofasciat</i>
		277	Bass, kelp	Paralabrax clathratus
		278	<i>Bass, barred sand</i>	<i>Paralabrax nebulifer</i>
		280	Bass, giant sea	Stereolepis gigas
		400	Seabass, white	Atractoscion nobilis
7	Salmon	300	Salmon	Oncorhynchus spp.
		301	<i>Salmon, chum</i>	<i>Oncorhynchus keta</i>
		302	Salmon, chinook	Oncorhynchus tshawytscha
		303	<i>Salmon, pink</i>	<i>Oncorhynchus goroscha</i>
		304	Salmon, coho	Oncorhynchus kisutch
		306	<i>Salmon, Roe (Chinook and Coho)</i>	<i>Onchorhynchus spp.</i>
8	Crab	341	Crab, red rock	Cancer productus
		342	Crab, yellow rock	Cancer anthonyi
		343	Crab, brown rock	Cancer antennarius
		800	Crab, Dungeness	Cancer magister
		801	Crab, rock unspecified	Cancer spp.
		802	Crab, claws	Cancer spp.
		803	Crab, spider	Loxorhynchus spp.
		804	Crab, king	Paralithodes spp.
		805	Crab, sand	Emerita analoga
		806	Crab, shore	Pachygrapsus crassipes
		807	Crab, pelagic red	Pleuroncodes planipes
		808	Crab, tanner	Chionoecetes tanneri
		809	Crab, box	Lopholithodes foraminatus
9	Shrimp	810	Shrimp, bay	Crangonidae
		811	<i>Shrimp, ghost</i>	<i>Callinassa californiensis</i>
		812	Shrimp, Pacific Ocean	Pandalus jordani
		814	Shrimp, unspecified	Crustacea



## APPENDIX C

Table C. 15. (continued)

Species Group Code	Species Group Name	CDFG Species Code	Common Name	Scientific Name
9	Shrimp (continued)	817	<i>Shrimp, coonstriped</i>	<i>Pandalus hypsinotus</i>
		818	Shrimp, red rock	<i>Lysmata californica</i>
		819	<i>Shrimp, brine</i>	<i>Artemia salina</i>
10	Spiny Lobster	820	Lobster, California spiny	<i>Panulirus interruptus</i>
11	Urchins	752	Urchin, red	<i>Strongylocentrotus francisc</i>
		753	Urchin, purple sea	<i>Strongylocentrotus purpurat</i>
12	Sea Cucumbers	755	Cucumber, sea	<i>Holothuroidea</i>
13	Roundfish	190	Sablefish	<i>Anoplopoma fimbria</i>
		191	Louvar	<i>Luvarus imperialis</i>
		195	Lingcod	<i>Ophiodon elongatus</i>
		290	Greenling, kelp	<i>Hexagrammos decagramm</i>
		495	Whiting, Pacific	<i>Merluccius productus</i>
14	Grenadiers	198	Grenadiers	<i>Macouridae</i>
15	Yellowtail	40	Yellowtail	<i>Seriola lalandi</i>
16	Swordfish	91	Swordfish	<i>Xiphias gladius</i>
17	Flatfish	200	Sole, unspecified	<i>Pleuronectiformes</i>
		201	Flounder, arrowtooth	<i>Atheresthes stomias</i>
		202	<i>Sole, bigmouth</i>	<i>Hippoglossina stomata</i>
		203	Sole, rock	<i>Pleuronectes bilineata</i>
		204	Sole, fantail	<i>Xystreurus liolepis</i>
		205	Sole, sand	<i>Psettichthys melanostictus</i>
		206	Sole, English	<i>Pleuronectes vetulus</i>
		207	Sole, rex	<i>Errex zachirus</i>
		208	<i>Sole, butter</i>	<i>Pleuronectes isolepis</i>
		209	Sole, petrale	<i>Eopsetta jordani</i>
		210	<i>Sole, slender</i>	<i>Eopsetta exilis</i>
		211	Sole, Dover	<i>Microstomus pacificus</i>
		212	Sole, tongue	<i>Symphurus atricauda</i>
		220	Halibut, unspecified	<i>Pleuronectiformes</i>
		221	<i>Halibut, Pacific</i>	<i>Hippoglossus stenolepis</i>
		222	Halibut, California	<i>Paralichthys californicus</i>
		225	Sanddab	<i>Citharichthys spp.</i>
		226	<i>Sanddab, longfin</i>	<i>Citharichthys xanthostigma</i>
		227	Sanddab, Pacific	<i>Citharichthys sordidus</i>
		228	<i>Sanddab, speckled</i>	<i>Citharichthys stigmaeus</i>

## APPENDIX C

Table C. 15. (continued)

Species Group Code	Species Group Name	CDFG Species Code	Common Name	Scientific Name
17	Flatfish (continued)	230	Flounder, unspecified	Pleuronectidae
		231	Flounder, starry	Platichthys stellatus
		235	<i>Turbot, curlfin</i>	<i>Pleuronichthys decurrens</i>
		236	<i>Turbot, diamond</i>	<i>Hypsopsetta guttulata</i>
		237	<i>Sole, C-O</i>	<i>Pleuronichthys coenosus</i>
		238	<i>Turbot, hornyhead</i>	<i>Pleuronichthys verticalis</i>
		239	<i>Turbot, spotted</i>	<i>Pleuronichthys ritteri</i>
		240	Turbot	Pleuronectidae
18	Surf Perch	550	Surfperch, unspecified	Embiotocidae
		551	Surfperch, barred	Amphistichus argenteus
		552	Surfperch, black	Embiotoca jacksoni
		553	Surfperch, redtail	Amphistichus rhodoterus
		554	Surfperch, shiner	Cymatogaster aggregata
		556	<i>Surfperch, white</i>	<i>Phanerodon furcatus</i>
		557	Surfperch, walleye	Hyperprosopon argenteum
		558	Surfperch, rubberlip	Rhacochilus toxotes
		559	Surfperch, pile	Rhacochilus vacca
		560	<i>Surfperch, calico</i>	<i>Amphistichus koelzi</i>
		561	<i>Surfperch, dwarf</i>	<i>Micrometrus minimus</i>
		562	Surfperch, rainbow	Hypsurus caryi
		563	<i>Surfperch, pink</i>	<i>Zalemnius rosaceus</i>
		601	<i>Kahawai</i>	<i>Annipis trutta</i>
		602	Zebraperch	Hermosilla azurea
19	Abalone	700	Abalone	Haliotis spp.
		701	Abalone, black	Haliotis cracherodii
		702	Abalone, red	Haliotis rufescens
		703	Abalone, green	Haliotis fulgens
		704	Abalone, pink	Haliotis corrugata
		705	Abalone, white	Haliotis sorenseni
		706	Abalone, threaded	Haliotis assimilis
		707	Abalone, pinto	Haliotis kamtschatkana
		708	Abalone, flat	Haliotis walallensis
		709	Limpet, unspecified	Archaeogastropoda
20	Squid	710	Squid, jumbo	Doscidicus gigas
		711	Squid, market	Loligo opalescens
21	Octopus	712	Octopus, unspecified	Octopus spp.
22	Mussels & Snails	730	Mussel	Mytilus spp.
		731	Whelk, Kellet's	Kelletia Kelleti
		732	Snail, sea	Gastropoda
		736	Snails, moon	Polinices spp.
		746	<i>Snail, bubble</i>	<i>Bulla gouldiana</i>

## APPENDIX C

Table C.15. (Continued)

Species Group Code	Species Group Name	CDFG Species Code	Common Name	Scientific Name
22	Mussels & Snails (continued)	747	Snail, top	<i>Astraea undosa</i>
		749	Sea hare	<i>Aplysia</i> spp.
		751	Sea stars	Asteroidea
23	Anchovy & Sardines	110	Anchovy, northern	<i>Engraulis mordax</i>
		100	Sardine, Pacific	<i>Sardinops sagax caeruleus</i>
24	Herring & Roe	121	Herring, Pacific	<i>Clupea pallasii</i>
		122	Herring, roe	<i>Clupea pallasii</i>
25	Prawn	813	Prawn, ridgeback	<i>Eusicyonia ingentus</i>
		815	Prawn, spot	<i>Pandalus platyceros</i>
		816	Prawn, golden	<i>Penaeus Californiensis</i>
26	CA Sheephead	145	Sheephead, California	<i>Semicossyphus pulcher</i>
27	Other <sup>2</sup>	57	Wahoo	<i>Acanthocybium solanderi</i>
		80	Butterfish (Pacific pompano)	<i>Peprilus simillimus</i>
		130	Barracuda, California	<i>Sphyrna argentea</i>
		135	Mullet, striped	<i>Mugil cephalus</i>
		166	Ratfish, spotted	<i>Hydrolagus collieri</i>
		184	Jacksmelt	<i>Atherinopsis californiensis</i>
		189	Silversides	Atherinidae
		291	Triggerfish	Balistidae
		324	Shad, threadfin	<i>Dorosoma petenense</i>
		325	Shad, American	<i>Alosa sapidissima</i>
		346	Hardhead (freshwater)	<i>Mylopharodon conocephalus</i>
		340	Tilapia	<i>Tilapia</i> spp.
		420	Croaker, unspecified	Sciaenidae
		421	Croaker, black	<i>Cheilotrema saturnum</i>
		430	Grouper	<i>Mycteroperca Epinephelus</i>
		432	Grouper, Broomtail	<i>Mycteroperca xenarcha</i>
		435	Croaker, white	<i>Genyonemus lineatus</i>
		440	Queenfish	<i>Seriphus politus</i>
		450	Eel	Osteichthyes
		452	Eel, California moray	<i>Gymnothorax mordax</i>
		454	Eel, wolf	<i>Anarrhichthys ocellatus</i>
		456	Eel, monkeyface	<i>Cebidichthys violaceus</i>
		457	Hagfishes	<i>Eptatretus</i> spp.
		467	Opah	<i>Lampris guttatus</i>
		473	Lizardfish, California	<i>Synodus lucioceps</i>
		475	Opaleye	<i>Girella nigricans</i>
		476	Needlefish, California	<i>Strongylura exilis</i>
		478	Halfmoon	<i>Medialuna californiensis</i>
		479	Blacksmith	<i>Chromis punctipinnis</i>
		480	Sargo	<i>Anisotremus davidsonii</i>
		481	Dolphin (fish)	<i>Coryphaena hippurus</i>

## APPENDIX C

Table C.15. (Continued)

Species Group Code	Species Group Name	CDFG Species Code	Common Name	Scientific Name
27	Other (continued)			
		485	Midshipman, planifin	<i>Porichthys notatus</i>
		490	Whitefish, ocean	<i>Caulolatilus princeps</i>
		999	Fish, unspecified	<i>Osteichthyes</i>

1. Species in italics were not caught in any of the study areas.
2. All species under Other were caught in the study areas.

## APPENDIX C

Table C5. Landings Distribution

Landings Distribution by Port: Squid

Port	Port Name	County	Value	Percent	Percent
	605 Port Hueneme	Ventura	50,048,318	0.817330157	81.7330
	606 Morro Bay	San Luis Obispo	17,140	0.00027991	0.0280
	608 Oxnard/Channel Islands Harbor	Ventura	6,601	0.0001078	0.0108
	611 Santa Barbara Harbor	Santa Barbara	559,666	0.009139806	0.9140
	613 Ventura Harbor	Ventura	3,949,838	0.0645041	6.4504
	745 Terminal Island	Los Angeles	1,317,869	0.021521884	2.1522
	748 New Port Beach	Orange	98	1.60042E-06	0.0002
OLA	Other Los Angeles	Los Angeles	7,746	0.000126499	0.0126
	770 San Pedro	Los Angeles	5,326,630	0.086988245	8.6988
	Total		61,233,906	1	100.0000

Landings Distribution by Port: Urchins

Port Code	Port Name	County	Value	Percent	Percent
	608 Oxnard/Channel Islands Harbor	Ventura	133,556.24	0.082434273	8.2434
	611 Santa Barbara Harbor	Santa Barbara	1,467,768.76	0.905943822	90.5944
	613 Ventura Harbor	Ventura	2,645.20	0.001632684	0.1633
	745 Terminal Island	Los Angeles	1,375.40	0.000848931	0.0849
	770 San Pedro	Los Angeles	6,067.80	0.003745199	0.3745
	880 San Diego	San Diego	8,740.89	0.005395097	0.5395
	Total		1,620,154.28	1	100.0000

Landings Distribution by Port: Spiny Lobsters

Port	Port Name	County	Value	Percent	Percent
	608 Oxnard/Channel Islands Harbor	Ventura	1,415.75	0.003873061	0.3873
	611 Santa Barbara Harbor	Santa Barbara	348,188.83	0.952538611	95.2539
	613 Ventura Harbor	Ventura	15,151.20	0.041449069	4.1449
	741 Avalon	Los Angeles	101.25	0.000276989	0.0277
	770 San Pedro	Los Angeles	680.73	0.00186227	0.1862
	Total		365,537.76	1	100.0000

Landings Distribution by Port: Rockfishes

Port	Port Name	County	Value	Percent	Percent
	606 Morro Bay	San Luis Obispo	4,023.15	0.11903353	11.9034
	608 Oxnard/Channel Islands Harbor	Ventura	1,235.97	0.036568826	3.6569
	611 Santa Barbara Harbor	Santa Barbara	28,365.35	0.839249776	83.9250
	613 Ventura Harbor	Ventura	174	0.005148164	0.5148
	Total		33,798.46	1	100.0000

Landings Distribution by Port: Prawn

Port	Port Name	County	Value	Percent	Percent
	605 Port Hueneme	Ventura	7,760.00	0.04686528	4.6865
	608 Oxnard/Channel Islands	Ventura	134,689.00	0.813432701	81.3433
	611 Santa Barbara Harbor	Santa Barbara	9,493.00	0.057331457	5.7331
	613 Ventura Harbor	Ventura	13,639.00	0.082370562	8.2371
	Total		165,581.00	1	100.0000

## APPENDIX C

Table C5. Landings Distribution (Cont.)

### Landings Distribution by Port: Crab

Port	Port Name	County	Value	Percent	Percent
	608 Oxnard/Channel Islands Harbor	Ventura	5,998.42	0.043971573	4.3972
	611 Santa Barbara Harbor	Santa Barbara	129,800.75	0.951507765	95.1508
	613 Ventura Harbor	Ventura	616.7	0.004520735	0.4521
	Total		136,415.86	1	100.0000

### Landings Distribution by Port: Wetfish

Port	Port Name	County	Value	Percent	Percent
	605 Port Hueneme	Ventura	841,713.00	0.84075538	84.0755
	608 Oxnard/Channel Islands Harbor	Ventura	3,916.00	0.003911545	0.3912
	613 Ventura Harbor	Ventura	330.00	0.000329625	0.0330
	592 Moss Landing	Monterey	304.00	0.000303654	0.0304
	770 San Pedro	Los Angeles	97,914.00	0.097802603	9.7803
	745 Terminal Island	Los Angeles	56,926.00	0.056861235	5.6861
OLA	Other Los Angeles	Los Angeles	36.00	3.5959E-05	0.0036
	Total		1,001,139.00	1	100.0000

### Landings Distribution by Port: CA Sheepshead

Port	Port Name	County	Value	Percent	Percent
	606 Morro Bay	San Luis Obispo	6.00	0.001630213	0.1630
	608 Oxnard/Channel Islands Harbor	Ventura	759.55	0.206371417	20.6371
	611 Santa Barbara Harbor	Santa Barbara	901.10	0.244830865	24.4831
	613 Ventura Harbor	Ventura	1,518.85	0.412674908	41.2675
	770 San Pedro	Los Angeles	495.00	0.134492596	13.4493
	Total		3,680.50	1	100.0000

### Landings Distribution by Port: Flatfish

Port	Port Name	County	Value	Percent	Percent
	602 Avila/Port San Luis	San Luis Obispo	269.75	0.001598383	0.1598
	608 Oxnard/Channel Islands Harbor	Ventura	101,568.10	0.601833859	60.1834
	611 Santa Barbara Harbor	Santa Barbara	7,599.45	0.045029949	4.5030
	613 Ventura Harbor	Ventura	59,295.05	0.351348196	35.1348
	770 San Pedro	Los Angeles	32.00	0.000189614	0.0190
	Total		168,764.35	1	100.0000

### Landings Distribution by Port: Sea Cucumbers

Port	Port Name	County	Value	Percent	Percent
	608 Oxnard/Channel Islands Harbor	Ventura	48,429.70	0.774335519	77.4336
	611 Santa Barbara Harbor	Santa Barbara	13,226.85	0.211482205	21.1482
	770 San Pedro	Los Angeles	887.00	0.014182116	1.4182
	Total		62,543.56	1	100.0000

## APPENDIX C

Table C5. Landings Distribution (Cont.)

### Landings Distribution by Port: Sculpin & Bass

Port	Port Name	County	Value	Percent	Percent
	608 Oxnard/Channel Islands Harbor	Ventura	9,952.36	0.522201141	52.2201
	613 Ventura Harbor	Ventura	4,127.63	0.216577083	21.6577
	770 San Pedro	Los Angeles	4,975.80	0.261080632	26.1081
	Total		19,058.48	1	100.0000

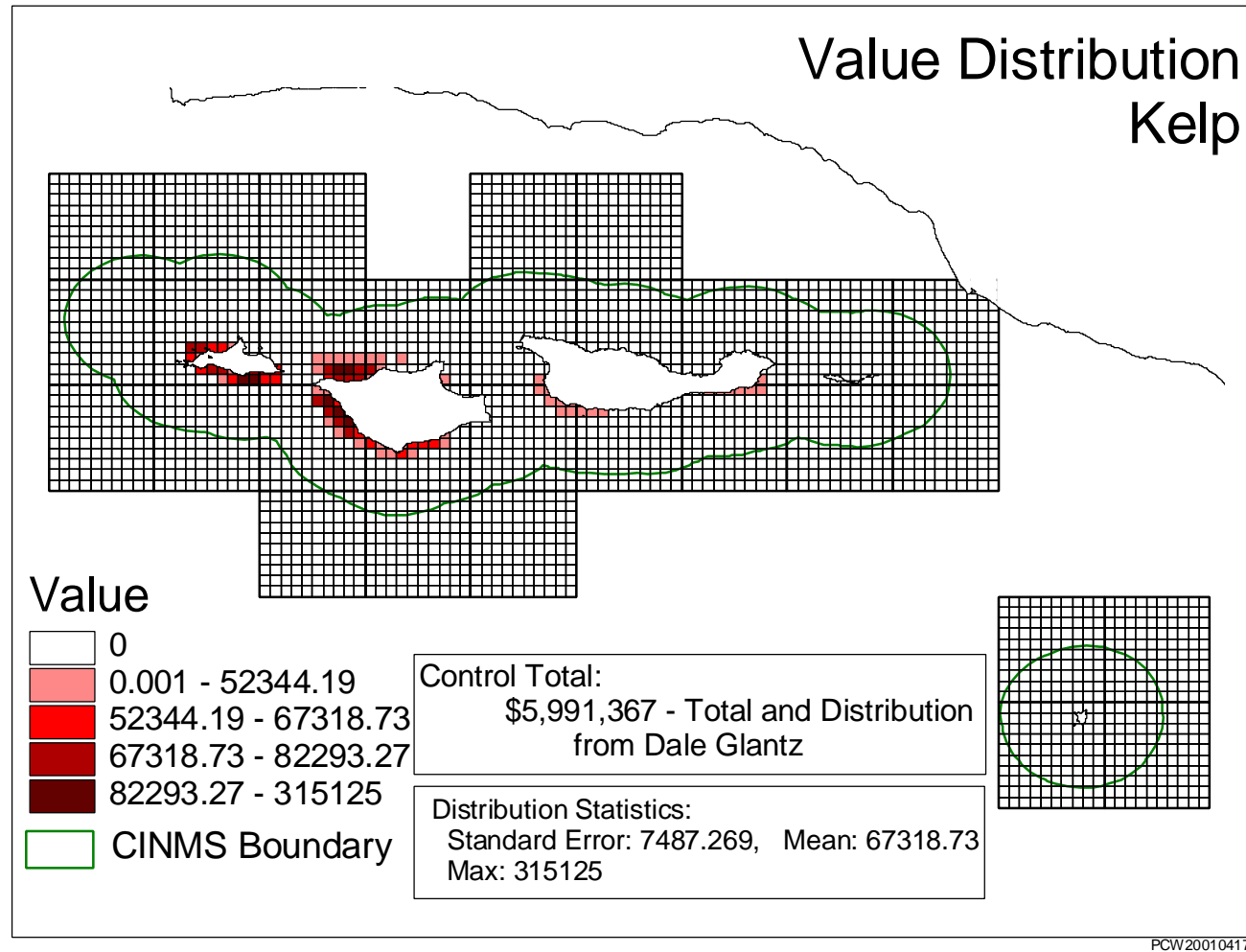
### Landings Distribution by Port: Tuna

Port	Port Name	County	Value	Percent	Percent
	605 Port Hueneme	Ventura	12,340	0.0314816	3.1482
	608 Oxnard/Channel Islands Harbor	Ventura	3,290	0.008393392	0.8393
	611 Santa Barbara Harbor	Santa Barbara	1,219	0.003109892	0.3110
	613 Ventura Harbor	Ventura	294	0.000750048	0.0750
	745 Terminal Island	Los Angeles	337,074	0.859937496	85.9937
	748 New Port Beach	Orange	288	0.000734741	0.0735
	770 San Pedro	Los Angeles	35,291	0.090033803	9.0034
	880 San Diego	San Diego	2,179	0.005559028	0.5559
	Total		391,975	1	100.0000

### Landings Distribution by Port: Sharks

Port	Port Name	County	Value	Percent	Percent
	602 Avila/Port San Luis	San Luis Obispo	19	0.000714685	0.0715
	608 Oxnard/Channel Islands Harbor	Ventura	13,175.60	0.495599987	49.5600
	613 Ventura Harbor	Ventura	5,639.15	0.212116539	21.2117
	745 Terminal Island	Los Angeles	6,910.00	0.259919542	25.9920
	770 San Pedro	Los Angeles	787.4	0.029618039	2.9618
	880 San Diego	San Diego	54	0.002031209	0.2031
	Total		26585.15	1	100.0000

## APPENDIX C





## APPENDIX C

### POPULATION

Squid in the Channel Islands National Marine Sanctuary - 22 block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	169	100.00	26,545,014	100.00
GE \$500,000	18	10.65	12,237,494	46.10
GE \$100,000	69	40.83	24,241,115	91.32
GE \$50,000	84	49.70	25,371,366	95.58
GE \$20,000	108	63.91	26,148,240	98.51
LT \$20,000	61	36.09	396,774	1.49
LT \$10,000	45	26.63	178,302	0.67
LT \$5,000	27	15.98	47,588	0.18
LT \$1,000	10	5.92	4,319	0.02

### SAMPLE

Squid in the Channel Islands National Marine Sanctuary - 22 block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	32	100.00	16,280,048	100.00
GE \$500,000	17	53.13	13,100,449	80.47
GE \$100,000	28	87.50	16,177,748	99.37
GE \$50,000	29	90.63	16,275,110	99.97
GE \$20,000	29	90.63	16,275,110	99.97
LT \$20,000	4	12.50	4,938	0.03
LT \$10,000	4	12.50	4,938	0.03
LT \$5,000	4	12.50	4,938	0.03
LT \$1,000	1	3.13	632	0.00

**Sample is 21.89% of the squid fishing operations in CINMS and accounts for 95.15% of total squid revenue from the CINMS. Does not include revenue from four light boats in sample. Light boats get 20 percent of the revenue of the boats they provide lighting services.**

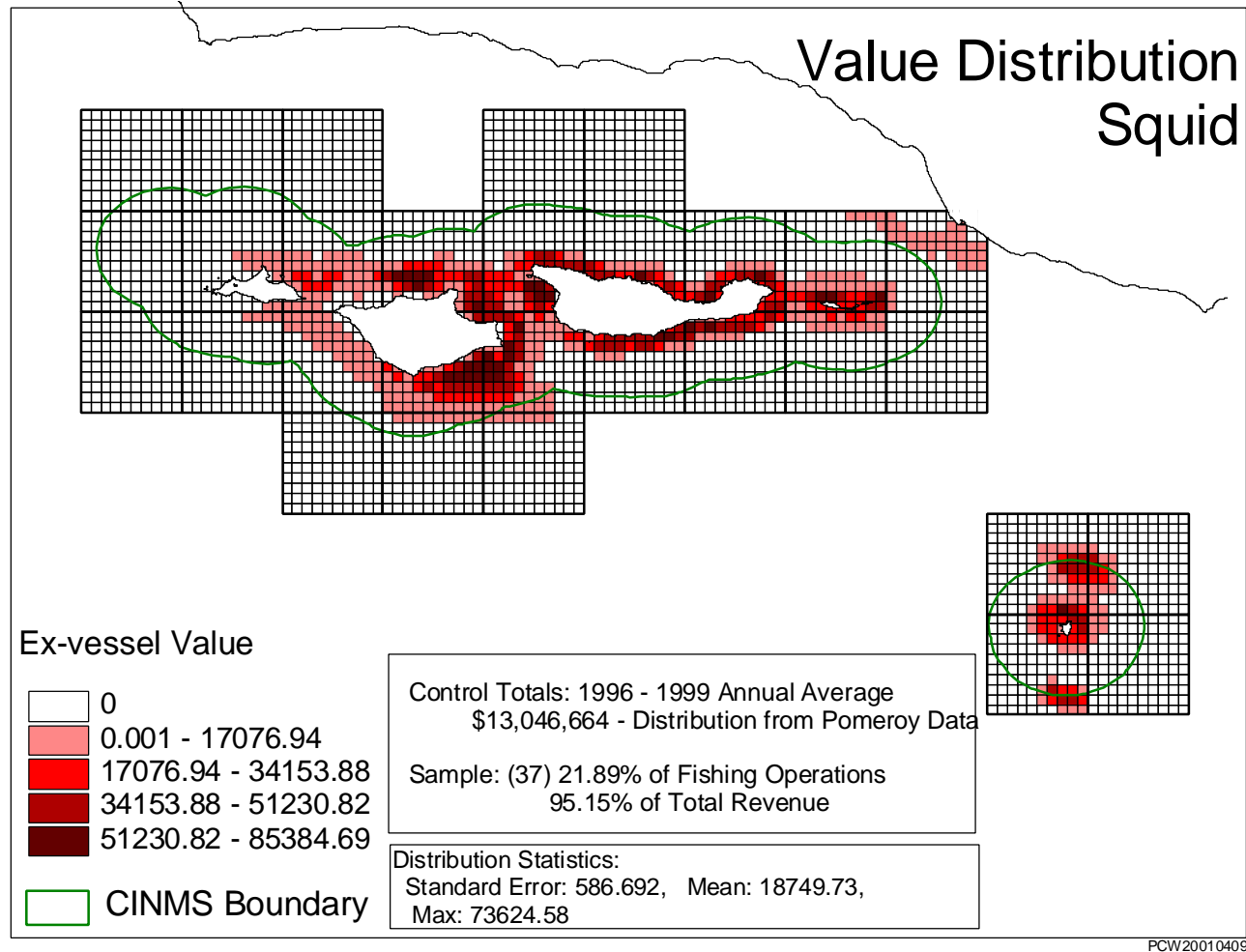
GT stands for Greater Than.

GE stands for Greater than or Equal to.

LT stands for Less Than.

LE stands for Less than or Equal to.

## APPENDIX C



## APPENDIX C

### POPULATION

Wetfish in Channel Islands National Marine Sanctuary - 22 Block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	37	100.00	605,259	100.00
GE \$50,000	4	10.81	396,316	65.48
GE \$20,000	7	18.92	501,242	82.81
GE \$10,000	10	27.03	544,952	90.04
GE \$5,000	16	43.24	581,537	96.08
GE \$1,000	24	64.86	603,299	99.68
LT \$1,000	13	35.14	1,959	0.32
LT \$500	12	32.43	1,425	0.24

### SAMPLE

Wetfish in Channel Islands National Marine Sanctuary - 22 Block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	13	100.00	351,034	100.00
GE \$50,000	2	15.38	275,031	78.35
GE \$20,000	3	23.08	308,943	88.01
GE \$10,000	4	30.77	319,843	91.11
GE \$5,000	8	61.54	347,925	99.11
GE \$1,000	9	69.23	349,892	99.67
LT \$1,000	4	30.77	1,142	0.33
LT \$500	3	23.08	587	0.17

**Sample is 54.05% of wetfish fishing operations in the CINMS and accounts for 84.48% of the wetfish revenues from the CINMS. Wetfish are caught by the squid fishermen as they are often referred to as the squid/wetfish fleet.**

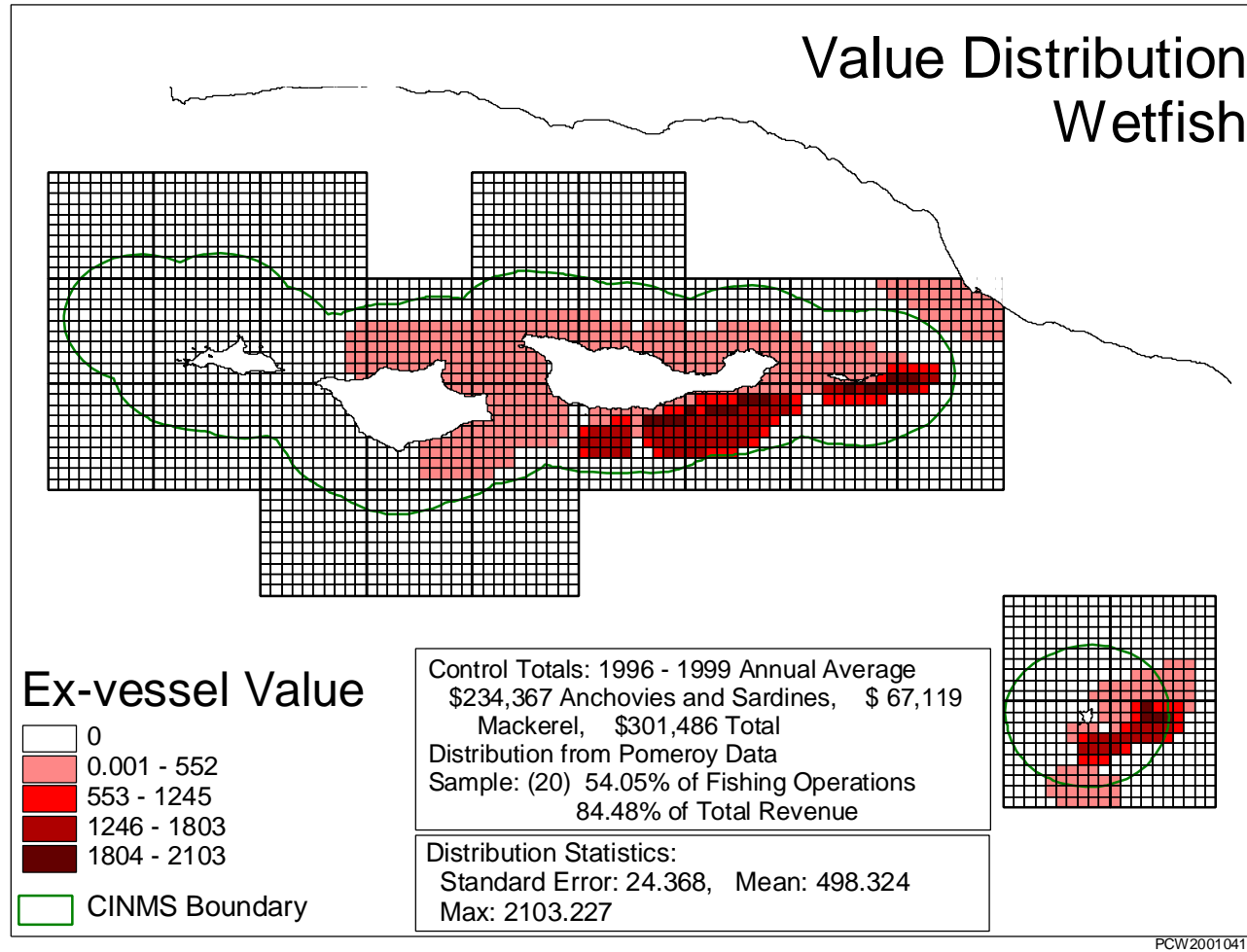
GT stands for Greater Than.

GE stands for Greater than or Equal to.

LT stands for Less Than.

LE stands for Less than or Equal to.

## APPENDIX C



## APPENDIX C

### POPULATION

Tuna in the Channel Islands National Marine Sanctuary - 22 block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	19	100.00	53,693	100.00
GE \$10,000	2	10.53	39,270	73.14
GE \$5,000	3	15.79	45,231	84.24
GE \$1,000	7	36.84	50,662	94.36
LT \$1,000	12	63.16	3,031	5.64
LT \$500	9	47.37	1,358	2.53

### SAMPLE

Tuna in the Channel Islands National Marine Sanctuary - 22 block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	4	100.00	4,181	100.00
GE \$10,000	0	0.00	0	0.00
GE \$5,000	0	0.00	0	0.00
GE \$1,000	2	50.00	3,831	91.63
LT \$1,000	2	50.00	350	8.37
LT \$500	2	50.00	350	8.37

**Sample is 36.84% of tuna fishing operations in the CINMS and accounts for 13.62% of the tuna revenues from the CINMS.**

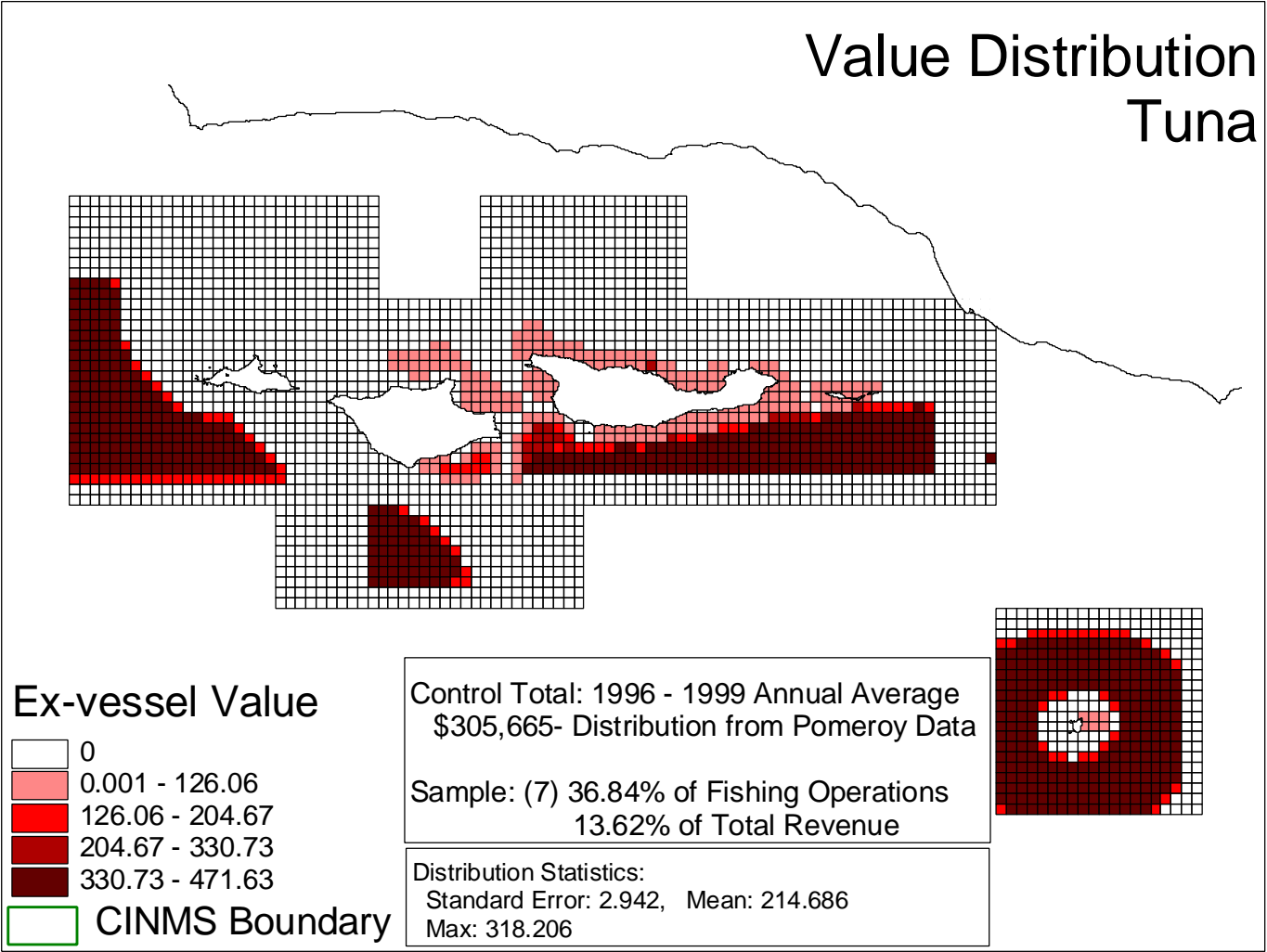
GT stands for Greater Than.

GE stands for Greater than or Equal to.

LT stands for Less Than.

LE stands for Less than or Equal to.

APPENDIX C



## APPENDIX C

### POPULATION

Urchins in Channel Islands National Marine Sanctuary - 22 Block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	331	100.00	5,969,017	100.00
GE \$50,000	27	8.16	1,842,302	30.86
GE \$40,000	53	16.01	3,028,599	50.74
GE \$30,000	83	25.08	4,070,498	68.19
GE \$20,000	111	33.53	4,774,826	79.99
GE \$10,000	157	47.43	5,422,317	90.84
LT \$10,000	174	52.57	546,699	9.16
LT \$5,000	127	38.37	203,041	3.40
LT \$1,000	61	18.43	35,721	0.60

### SAMPLE

Urchins in Channel Islands National Marine Sanctuary - 22 Block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	40	100.00	1,620,154	100.00
GE \$50,000	12	30.00	881,097	54.38
GE \$40,000	18	45.00	1,149,884	70.97
GE \$30,000	25	62.50	1,400,589	86.45
GE \$20,000	29	72.50	1,502,880	92.76
GE \$10,000	35	87.50	1,592,466	98.29
LT \$10,000	5	12.50	27,688	1.71
LT \$5,000	2	5.00	1,918	0.12
LT \$1,000	1	2.50	543	0.03

**Sample is 12.08% of all urchin fishing operations in CINMS and account for 27.17% of all urchin revenue from CINMS.**

GT stands for Greater Than.

GE stands for Greater than or Equal to.

LT stands for Less Than.

LE stands for Less than or Equal to.

## APPENDIX C

### POPULATION

Spiny Lobster in the Channel Islands National Marine Sanctuary - 22 block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	46	100.00	950,748	100.00
GE \$50,000	7	15.22	475,993	50.07
GE \$40,000	9	19.57	564,677	59.39
GE \$30,000	14	30.43	741,798	78.02
GE \$20,000	16	34.78	785,227	82.59
GE \$10,000	22	47.83	874,524	91.98
LT \$10,000	24	52.17	76,223	8.02
LT \$5,000	18	39.13	28,607	3.01
LT \$1,000	10	21.74	3,708	0.39

### SAMPLE

Spiny Lobster in the Channel Islands National Marine Sanctuary - 22 block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	8	100.00	365,538	100.00
GE \$50,000	3	37.50	247,226	67.63
GE \$40,000	5	62.50	335,910	91.89
GE \$30,000	5	62.50	335,910	91.89
GE \$20,000	5	62.50	335,910	91.89
GE \$10,000	7	87.50	361,112	98.79
LT \$10,000	1	12.50	4,426	1.21
LT \$5,000	1	12.50	4,426	1.21
LT \$1,000	0	0.00	0	0.00

**Sample is 17.39% of spiny lobster fishing operations in the CINMS and account for 38.36% of spiny lobster revenue from CINMS.**

GT stands for Greater Than.

GE stands for Greater than or Equal to.

LT stands for Less Than.

LE stands for Less than or Equal to.



## APPENDIX C

### POPULATION

Rockfishes in Channel Islands National Marine Sanctuary - 22 Block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	128	100.00	553,260	100.00
GE \$50,000	1	0.78	154,300	27.89
GE \$40,000	2	1.56	197,605	35.72
GE \$30,000	3	2.34	231,151	41.78
GE \$20,000	9	7.03	376,742	68.09
GE \$10,000	10	7.81	393,077	71.05
LT \$10,000	118	92.19	160,183	28.95
LT \$5,000	106	82.81	72,092	13.03
LT \$1,000	82	64.06	17,401	3.15

### SAMPLE

Rockfishes in Channel Islands National Marine Sanctuary - 22 Block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	10	100.00	33,798	100.00
GE \$50,000	0	0.00	0	0.00
GE \$40,000	0	0.00	0	0.00
GE \$30,000	0	0.00	0	0.00
GE \$20,000	1	10.00	27,649	81.81
GE \$10,000	1	10.00	27,649	81.81
LT \$10,000	9	90.00	6,149	18.19
LT \$5,000	9	90.00	6,149	18.19
LT \$1,000	5	50.00	470	1.39

**Sample is 7.81% of rockfish fishing operations in CINMS and accounts for 6.15% of rockfish revenues from the CINMS.**

GT stands for Greater Than.

GE stands for Greater than or Equal to.

LT stands for Less Than.

LE stands for Less than or Equal to.

## APPENDIX C

### POPULATION

Prawn in Channel Islands National Marine Sanctuary - 22 Block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	30	100.00	725,404	100.00
GE \$50,000	5	16.67	421,453	58.10
GE \$40,000	6	20.00	466,052	64.25
GE \$30,000	9	30.00	576,109	79.42
GE \$20,000	10	33.33	597,794	82.41
GE \$10,000	17	56.67	698,507	96.29
LT \$10,000	13	43.33	26,897	3.71
LT \$5,000	11	36.67	13,693	1.89
LT \$1,000	6	20.00	2,273	0.31

**Barilotti Sample only contained three Prawn fishermen. CDFG 10 by 10 mile block data was distributed according to 1 by 1 mile blocks using Exclusion Zone maps provided by the fishermen. Data from block 690 was distributed to 1 by 1 mile blocks contained in blocks 690, 671 and 672 of the Exclusion Zone maps. Data from block 711 was distributed to 1 by 1 mile blocks contained in blocks 711 and 730. The CDFG blocks around Santa Barbara Island showed low levels of catch, but the fishermen did not include any 1 by 1 mile blocks in the Exclusion Zone maps for this area.**

GT stands for Greater Than.

GE stands for Greater than or Equal to.

LT stands for Less Than.

LE stands for Less than or Equal to.

## APPENDIX C

### POPULATION

Crab in the Channel Islands National Marine Sanctuary - 22 block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	71	100.00	313,320	100.00
GE \$20,000	5	7.04	209,805	66.96
GE \$10,000	8	11.27	243,501	77.72
GE \$5,000	14	19.72	280,081	89.39
GE \$1,000	23	32.39	300,912	96.04
LT \$1,000	48	67.61	12,408	3.96
LT \$500	40	56.34	7,126	2.27

### SAMPLE

Crab in the Channel Islands National Marine Sanctuary - 22 block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	12	100.00	136,416	100.00
GE \$20,000	3	25.00	128,456	94.16
GE \$10,000	3	25.00	128,456	94.16
GE \$5,000	4	33.33	133,936	98.18
GE \$1,000	5	41.67	135,162	99.08
LT \$1,000	7	58.33	1,254	0.92
LT \$500	6	50.00	750	0.55

**Sample is 16.90% of crab fishing operations in CINMS and accounts for 43.54% of the crab fishing revenue from the CINMS. The Barilotti Sample did not include any information from fishermen catching crabs for the eastern half of the study area. CDFG data show a relatively low amount of crabs being caught from the eastern half. CDFG 10 by 10 mile grid totals were apportioned to 1 by 1 mile blocks within three miles from shorelines within the CDFG blocks. Block 706 contained \$70.50 but contains no blocks within three miles from shore.**

GT stands for Greater Than.

GE stands for Greater than or Equal to.

LT stands for Less Than.

LE stands for Less than or Equal to.

## APPENDIX C

### POPULATION

CA Sheephead in Channel Islands National Marine Sanctuary - 22 Block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	92	100.00	153,140	100.00
GE \$20,000	2	2.17	70,298	45.90
GE \$10,000	4	4.35	95,393	62.29
GE \$5,000	6	6.52	111,802	73.01
LT \$5,000	86	93.48	41,338	26.99
LT \$1,000	75	81.52	19,261	12.58
LT \$500	63	68.48	10,445	6.82

### SAMPLE

CA Sheephead in Channel Islands National Marine Sanctuary - 22 Block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	13	100.00	3,680	100.00
GE \$20,000	0	0.00	0	0.00
GE \$10,000	0	0.00	0	0.00
GE \$5,000	0	0.00	0	0.00
LT \$5,000	13	100.00	3,680	100.00
LT \$1,000	12	92.31	2,666	72.45
LT \$500	10	76.92	1,858	50.49

**Sample is 14.13% of sheephead fishing operations in the CINMS but only accounts for 2.40% of sheephead revenue from the CINMS.**

GT stands for Greater Than.

GE stands for Greater than or Equal to.

LT stands for Less Than.

LE stands for Less than or Equal to.

## APPENDIX C

### POPULATION

Flatfishes in the Channel Islands National Marine Sanctuary - 22 block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	85	100.00	323,568	100.00
GE \$50,000	3	3.53	213,068	65.85
GE \$10,000	6	7.06	249,009	76.96
GE \$5,000	9	10.59	274,809	84.93
GE \$1,000	22	25.88	305,708	94.48
LT \$1,000	63	74.12	17,860	5.52
LT \$500	50	58.82	8,045	2.49

### SAMPLE

Flatfishes in the Channel Islands National Marine Sanctuary - 22 block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	8	100.00	168,764	100.00
GE \$50,000	2	25.00	158,385	93.85
GE \$10,000	2	25.00	158,385	93.85
GE \$5,000	3	37.50	167,499	99.25
GE \$1,000	3	37.50	167,499	99.25
LT \$1,000	5	62.50	1,265	0.75
LT \$500	4	50.00	741	0.44

**Sample is 9.41% of flatfish fishing operations in CINMS and accounts for 51.98% of the flatfish revenues from the CINMS.**

GT stands for Greater Than.

GE stands for Greater than or Equal to.

LT stands for Less Than.

LE stands for Less than or Equal to.

## APPENDIX C

### POPULATION

Sea Cucumbers in the Channel Islands National Marine Sanctuary - 22 block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	61	100.00	269,017	100.00
GE \$20,000	3	4.92	99,855	37.12
GE \$10,000	8	13.11	169,185	62.89
GE \$5,000	16	26.23	226,574	84.22
GE \$1,000	30	49.18	259,491	96.46
LT \$1,000	31	50.82	9,526	3.54
LT \$500	26	42.62	6,235	2.32

### SAMPLE

Sea Cucumbers in the Channel Islands National Marine Sanctuary - 22 block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	11	100.00	62,544	100.00
GE \$20,000	0	0.00	0	0.00
GE \$10,000	2	18.18	31,760	50.78
GE \$5,000	5	45.45	55,143	88.17
GE \$1,000	7	63.64	60,337	96.47
LT \$1,000	4	36.36	2,207	3.53
LT \$500	2	18.18	779	1.25

**Sample is 18.03% of Sea Cucumber fishing operations in the CINMS and accounts for 23.45% of the Sea Cucumber revenue from the CINMS. Urchin divers are the primary harvesters of Sea Cucumbers.**

GT stands for Greater Than.

GE stands for Greater than or Equal to.

LT stands for Less Than.

LE stands for Less than or Equal to.

## APPENDIX C

### POPULATION

Sculpin & Bass in the Channel Islands National Marine Sanctuary - 22 block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	43	100.00	103,379	100.00
GE \$10,000	3	6.98	59,177	57.24
GE \$5,000	5	11.63	73,413	71.01
GE \$1,000	15	34.88	96,541	93.39
LT \$1,000	28	65.12	6,838	6.61
LT \$500	25	58.14	4,758	4.60

### SAMPLE

Sculpin & Bass in the Channel Islands National Marine Sanctuary - 22 block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	5	100.00	19,058	100.00
GE \$10,000	0	0.00	0	0.00
GE \$5,000	1	20.00	8,037	42.17
GE \$1,000	4	80.00	11,021	57.83
LT \$1,000	0	0.00	0	0.00
LT \$500	0	0.00	0	0.00

**Sample is 11.63% of Sculpin & Bass fishing operations in CINMS and accounts for 21.52% of Sculpin & Bass revenue from the CINMS.**

GT stands for Greater Than.

GE stands for Greater than or Equal to.

LT stands for Less Than.

LE stands for Less than or Equal to.

## APPENDIX C

### POPULATION

Sharks in Channel Islands National Marine Sanctuary - 22 Block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	40	100.00	41,948	100.00
GE \$10,000	1	2.50	14,080	33.57
GE \$2,000	7	17.50	29,074	69.31
GE \$1,000	12	30.00	36,007	85.84
LT \$1,000	28	70.00	5,940	14.16
LT \$500	25	62.50	3,751	8.94

### SAMPLE

Sharks in Channel Islands National Marine Sanctuary - 22 Block Definition

Value	Number of Fishing Operations	Percent of Fishing Operations	Sum of 1999 Ex Vessel Value	Percent of 1999 Ex Vessel Value
GT \$0	6	100.00	18,220	100.00
GE \$10,000	1	16.67	14,081	77.28
GE \$2,000	1	16.67	14,081	77.28
GE \$1,000	3	50.00	17,241	94.63
LT \$1,000	3	50.00	979	5.37
LT \$500	2	33.33	467	2.56

**Sample is 15.0% of shark fishing operations in CINMS and accounts for 43.76% of shark revenues from the CINMS.**

GT stands for Greater Than.

GE stands for Greater than or Equal to.

LT stands for Less Than.

LE stands for Less than or Equal to.

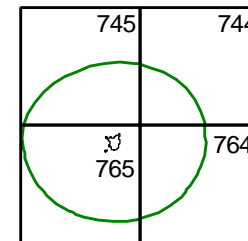
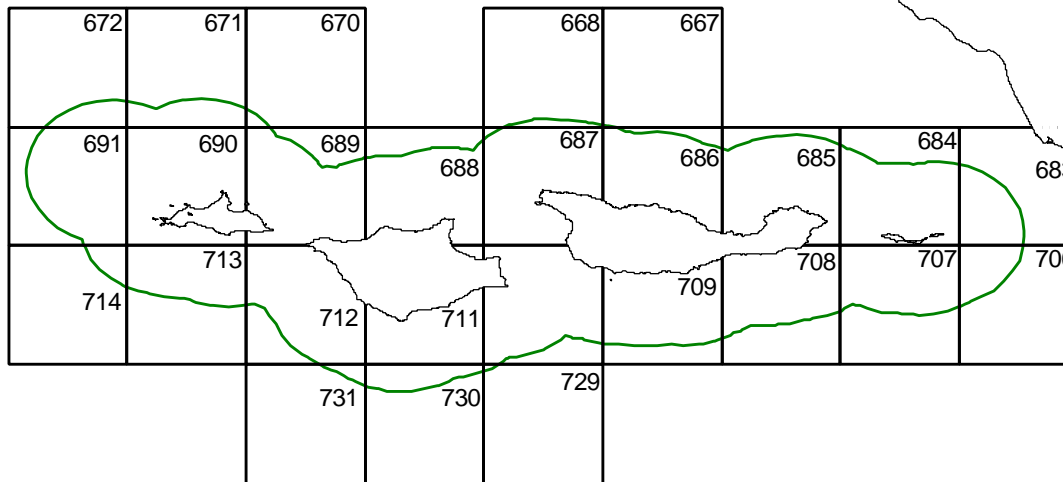


## APPENDIX C

Species/Species Group	1996-1999 Avg. Value	Percent of CINMS
Abalone	178,027	0.878273
Swordfish	39,090	0.192845
Roundfish	33,262	0.164094
Other	22,990	0.113418
Yellowtail	6,891	0.033996
Shrimp	5,813	0.028678
Mussels, Snails	4,694	0.023157
Salmon	1,411	0.006961
Rays & Skates	1,164	0.005742
Surf Perch	695	0.003429
Grenadiers	211	0.001041
Octopus	196	0.000967
<b>Total</b>	<b>294,444</b>	<b>1.452601</b>
<b>Total, Excluding Abalone</b>	<b>116,417</b>	<b>0.574328</b>

## APPENDIX C

### Study Area CDFG Blocks

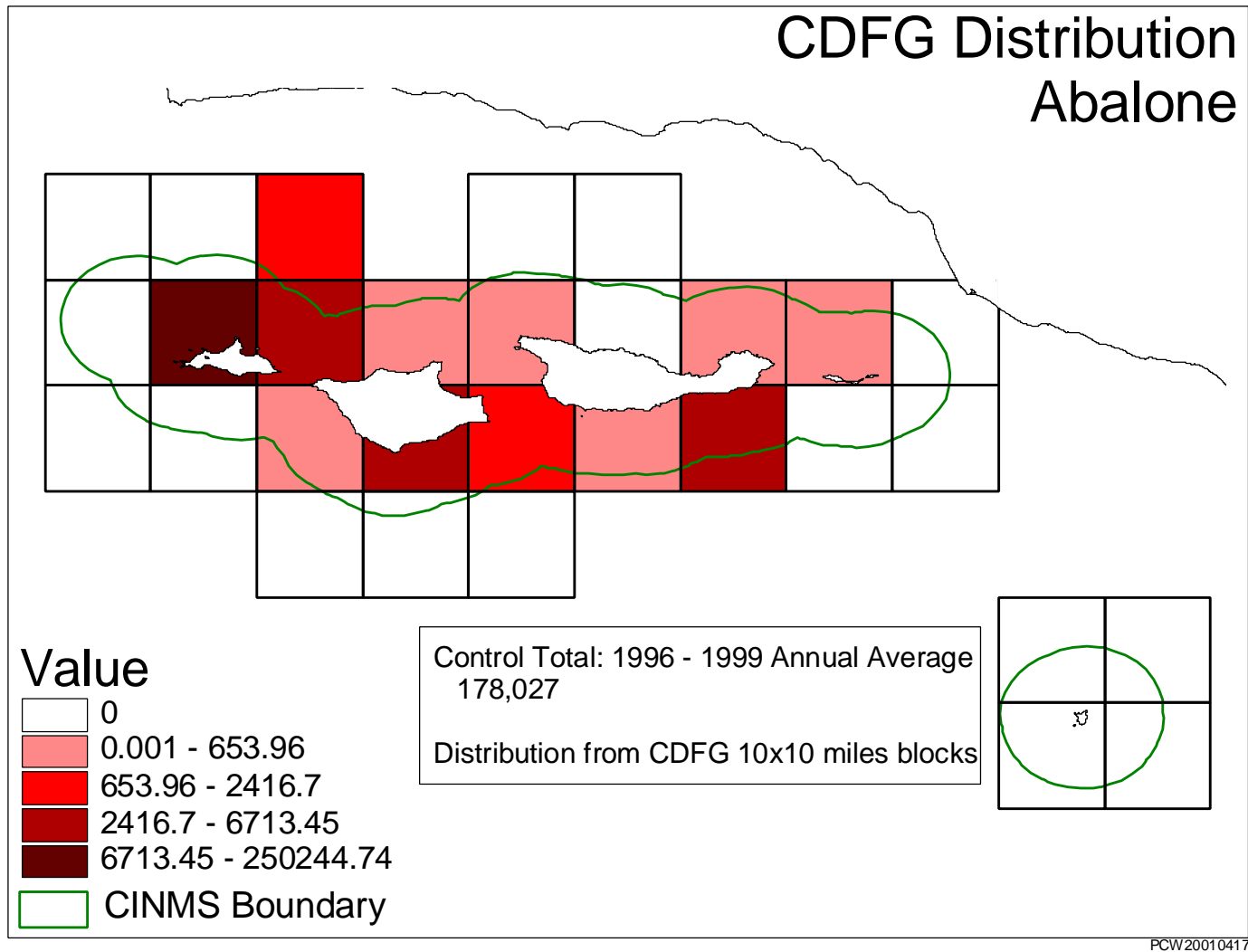


Note: Blocks 667, 668, 670, 671, 672, 729, 730, and 731 are not in the 22 block study area definition.

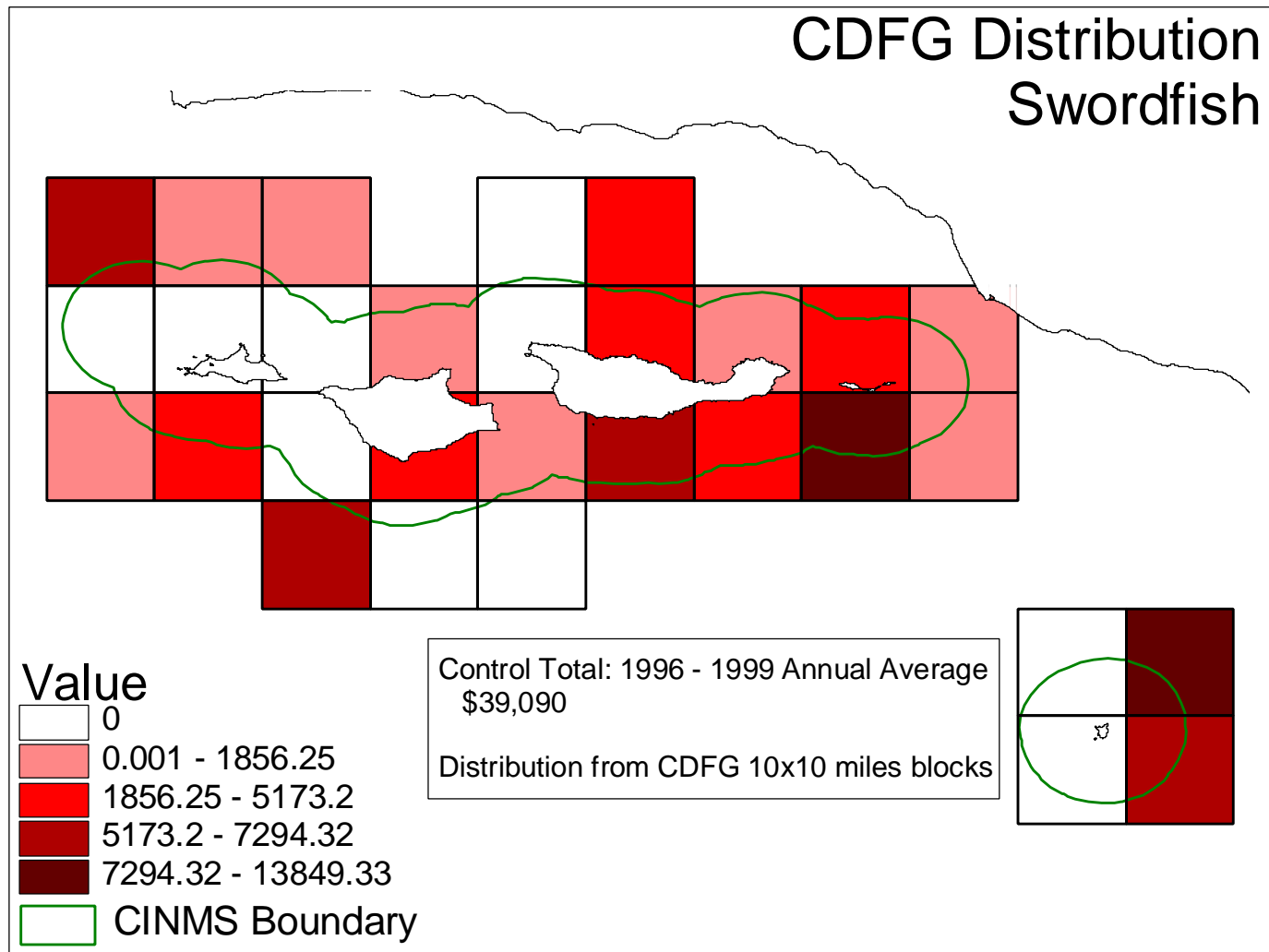
 CINMS Boundary

PCW20010209

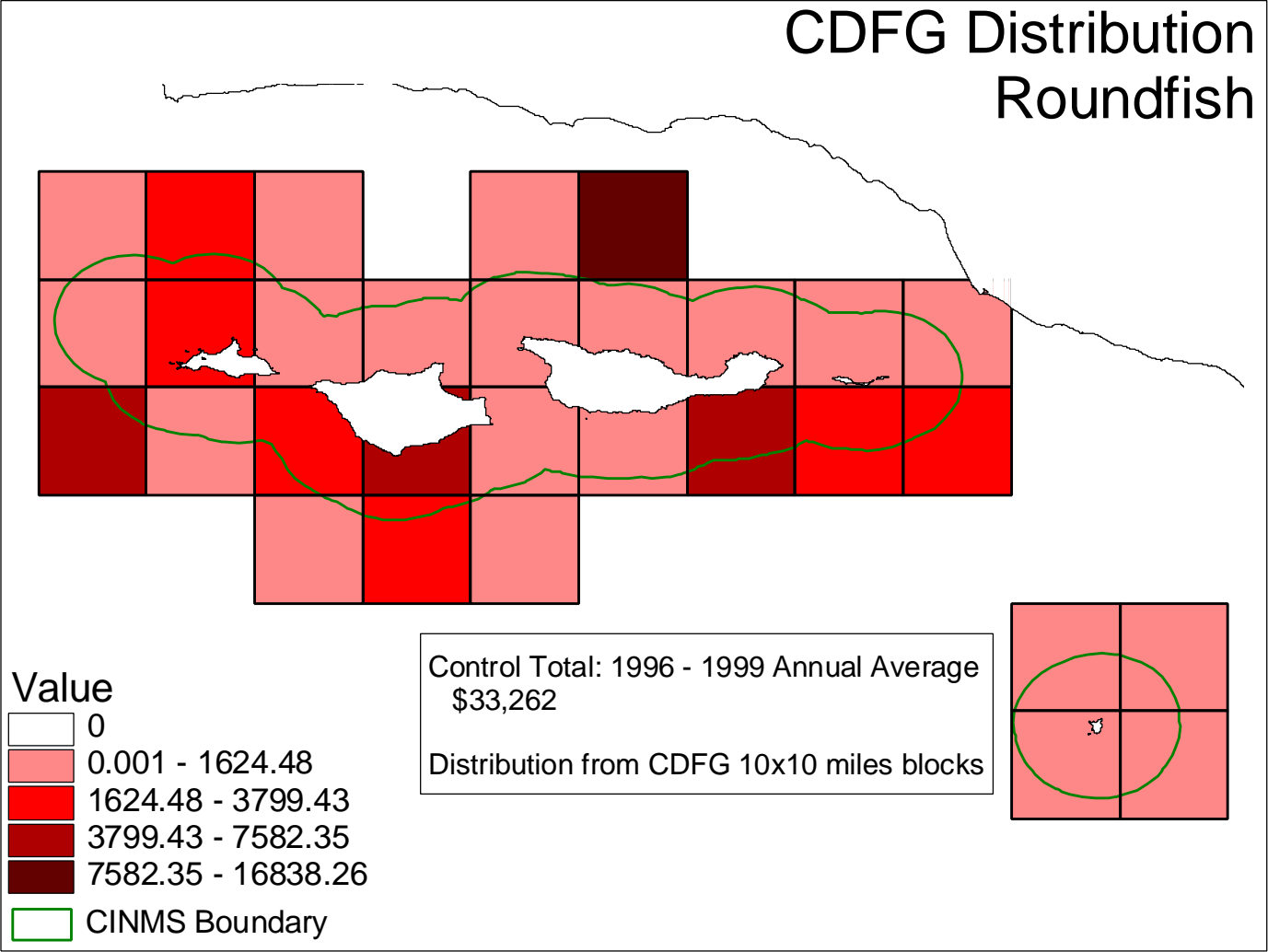
## APPENDIX C



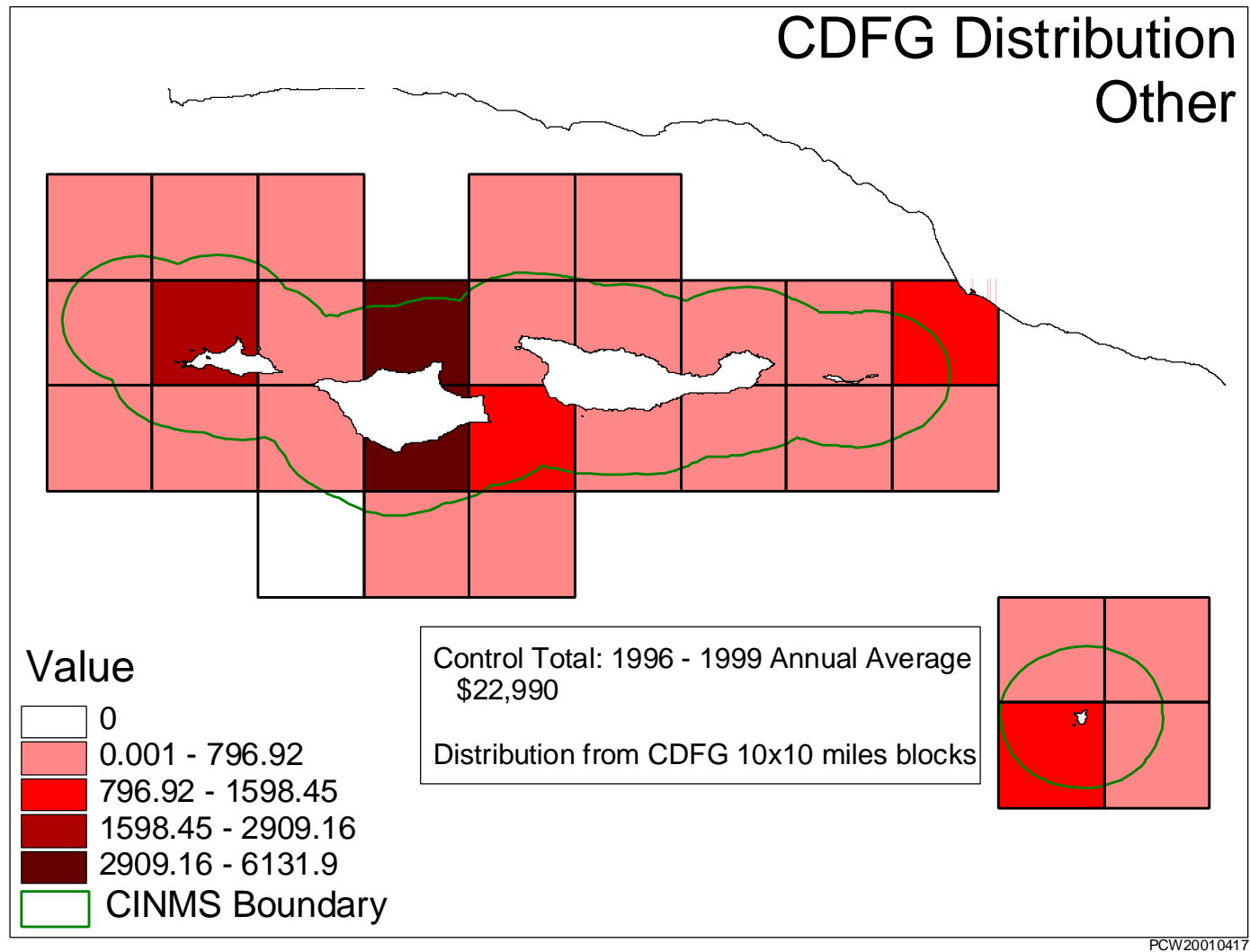
## APPENDIX C



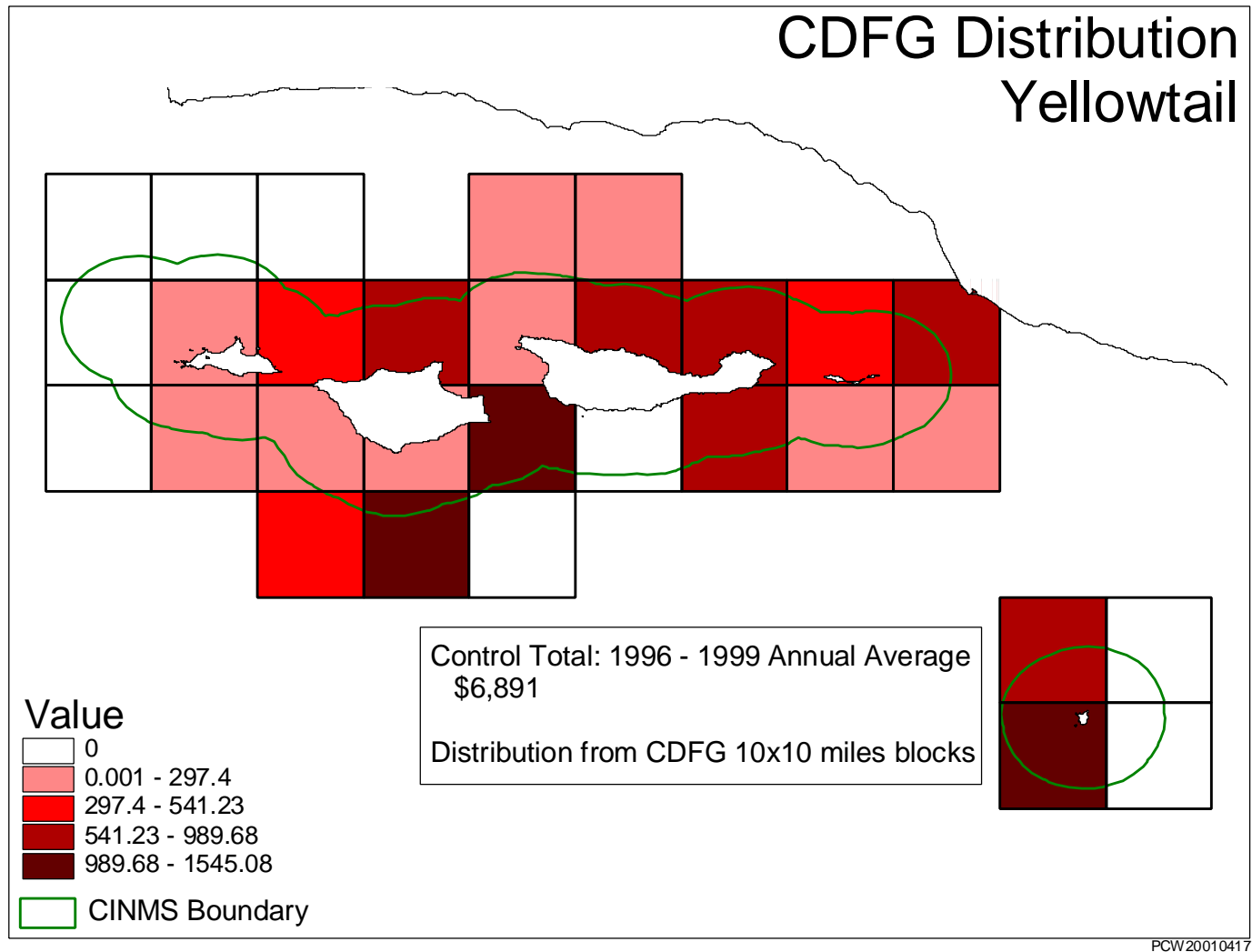
APPENDIX C



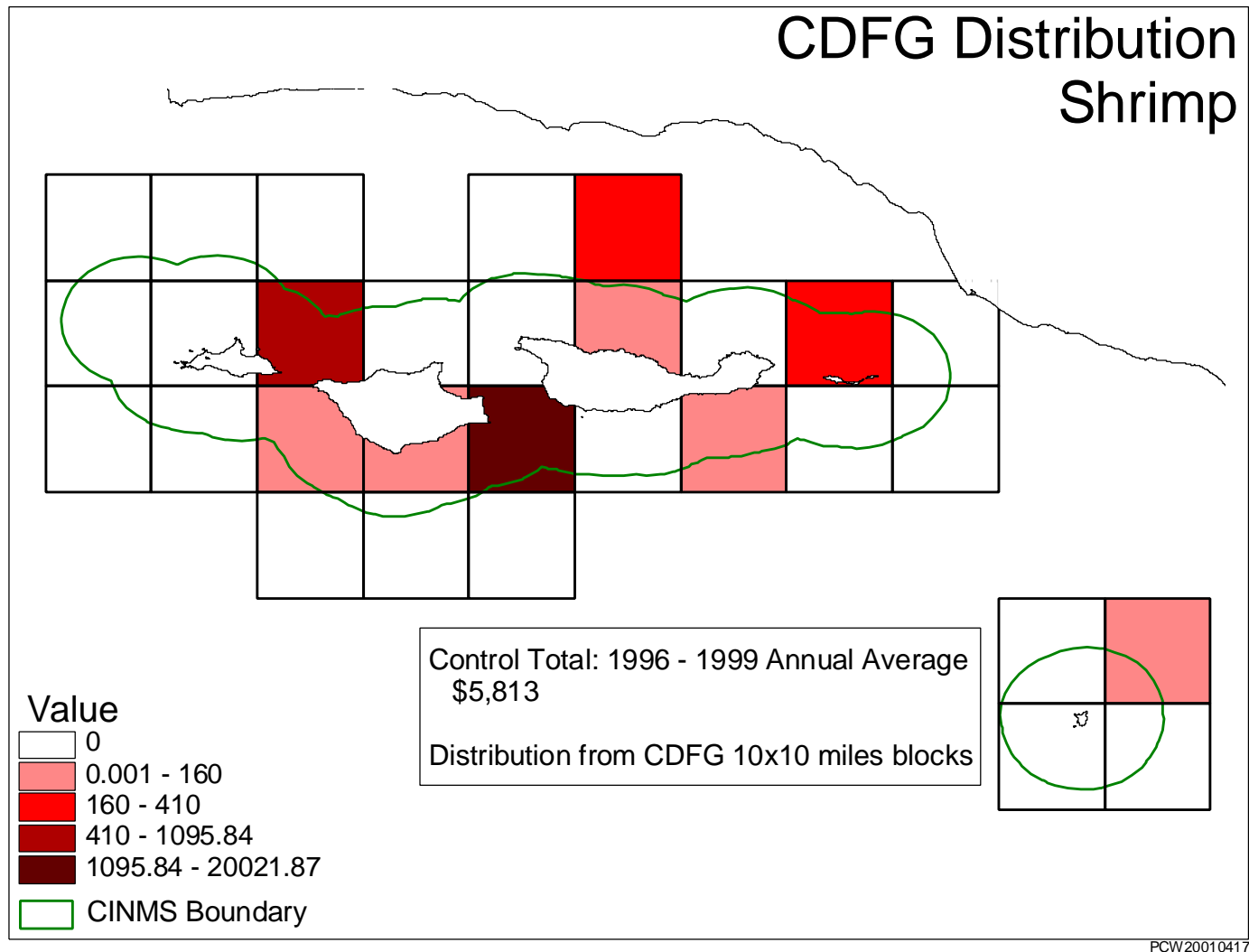
## APPENDIX C



## APPENDIX C

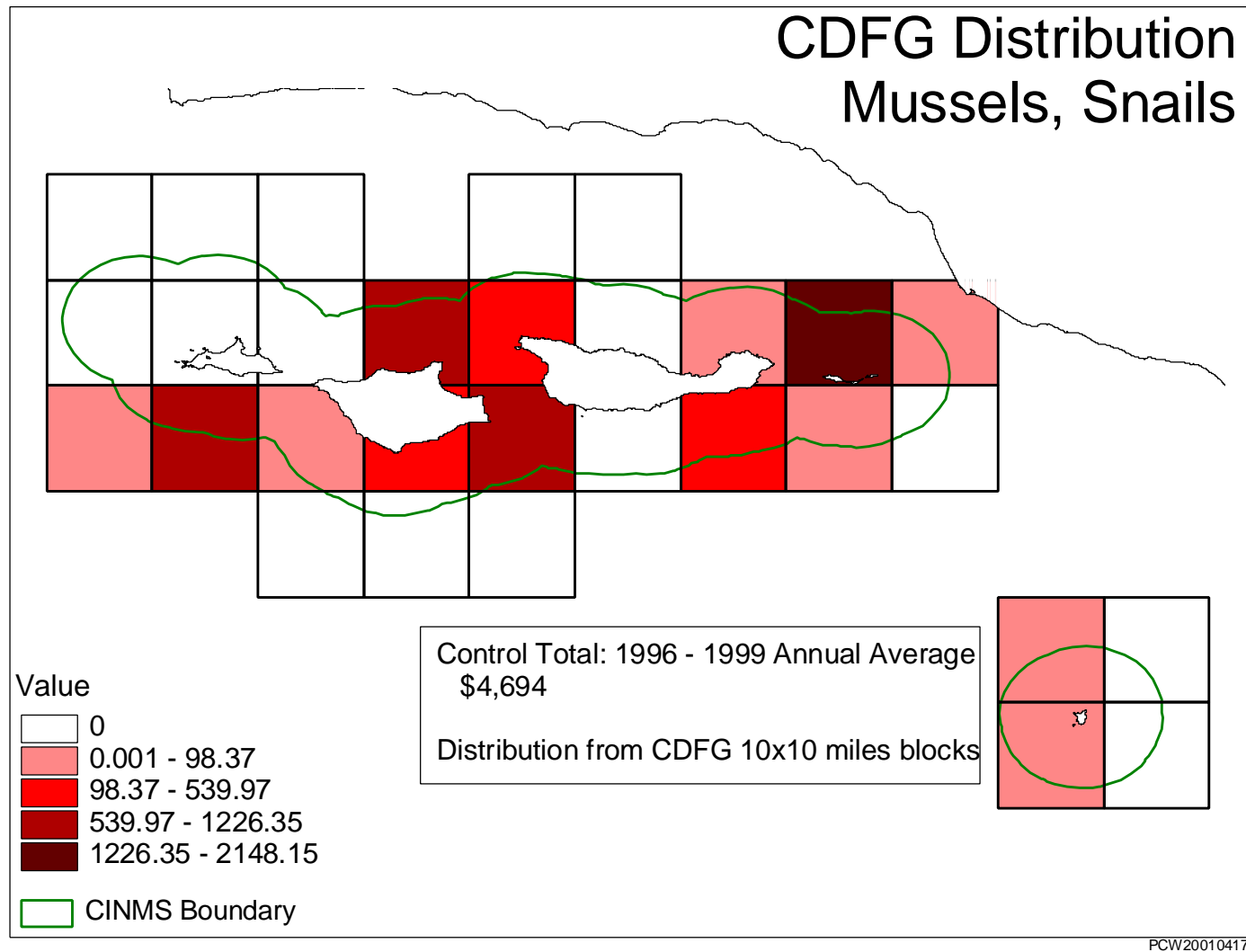


## APPENDIX C

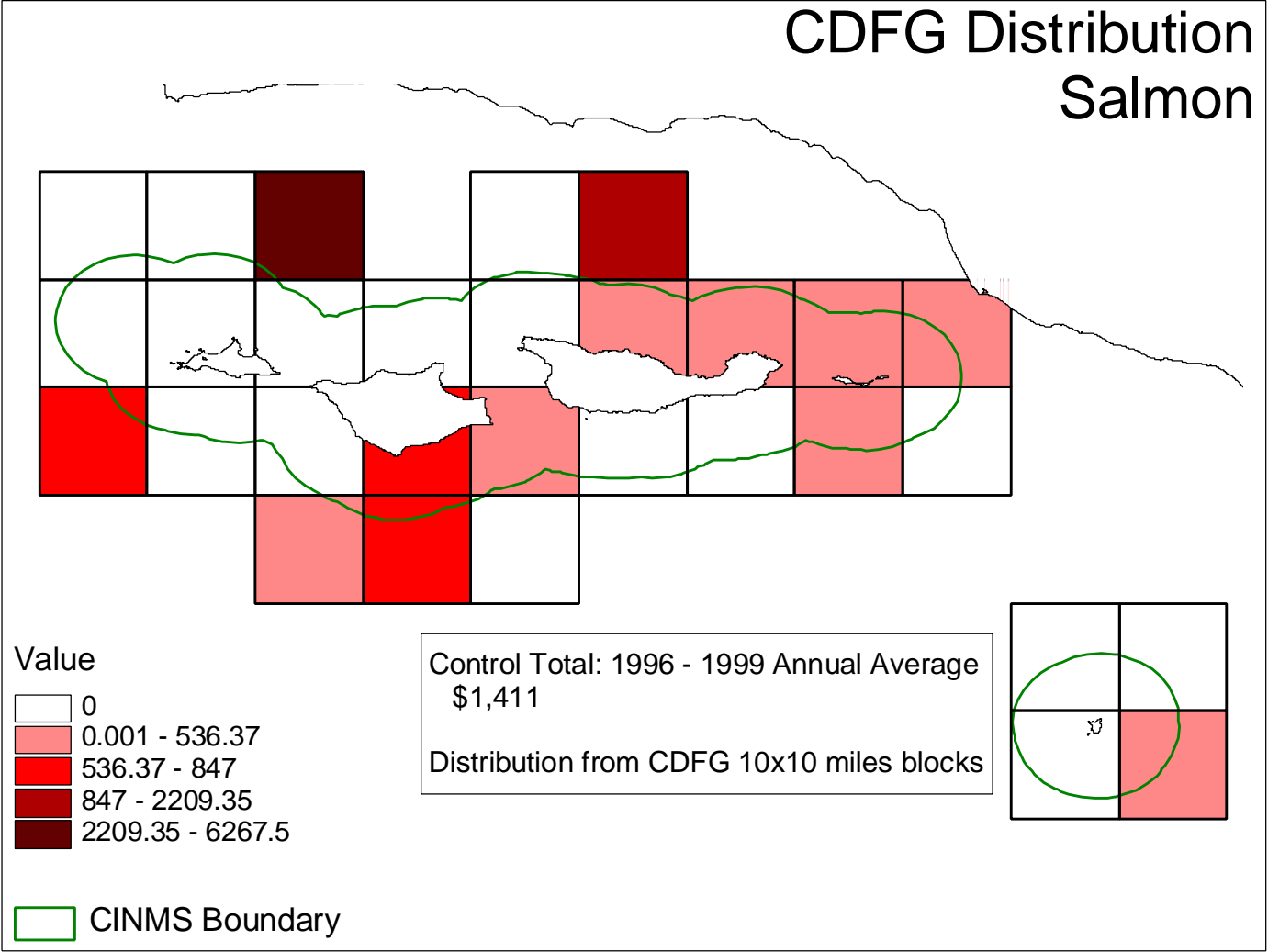




## APPENDIX C

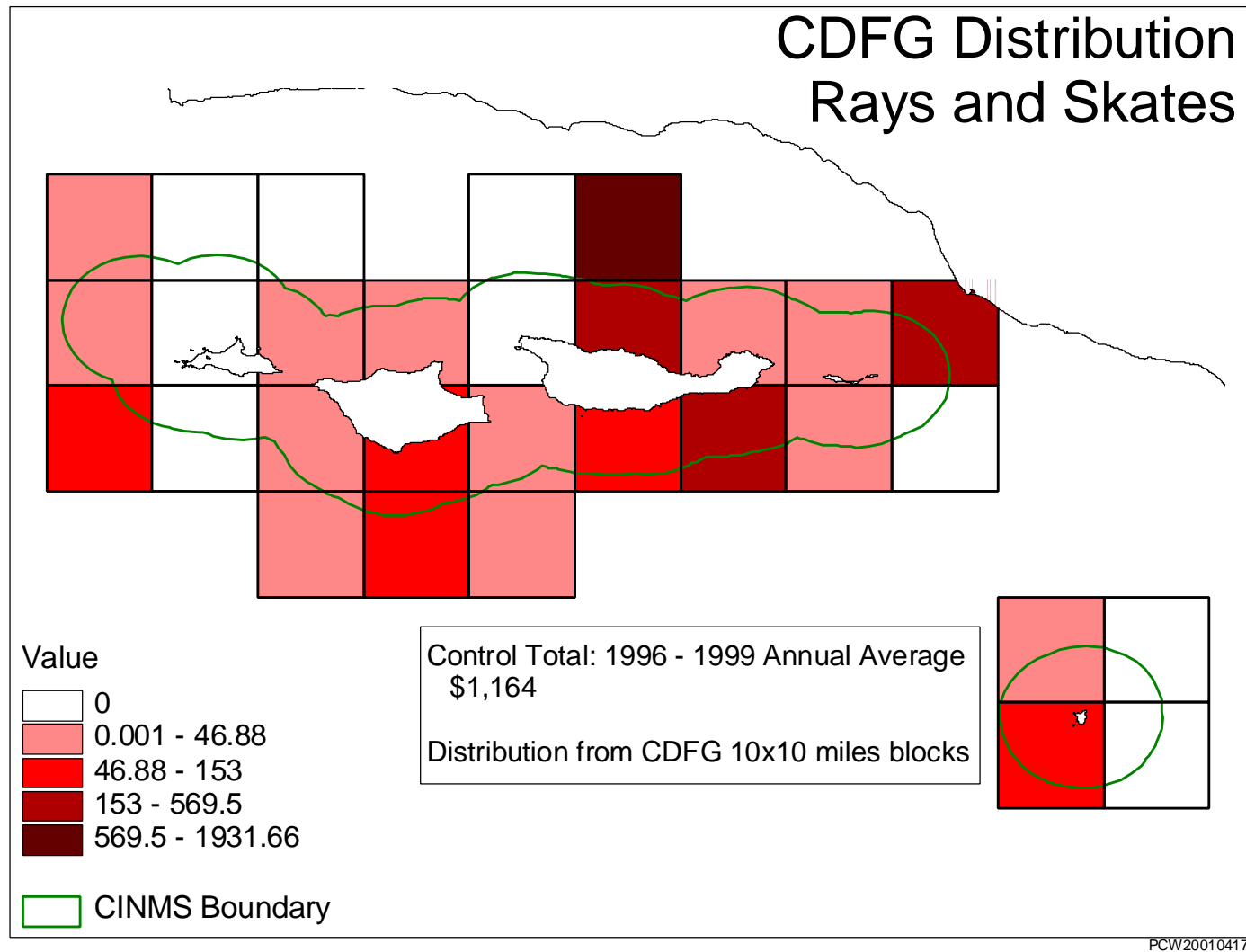


APPENDIX C

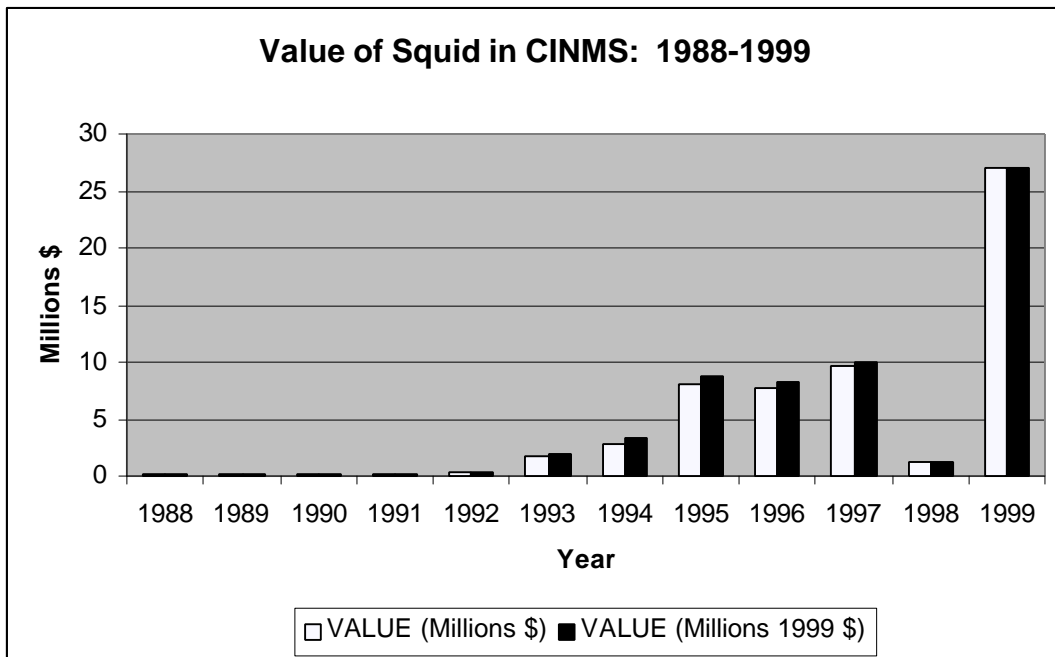
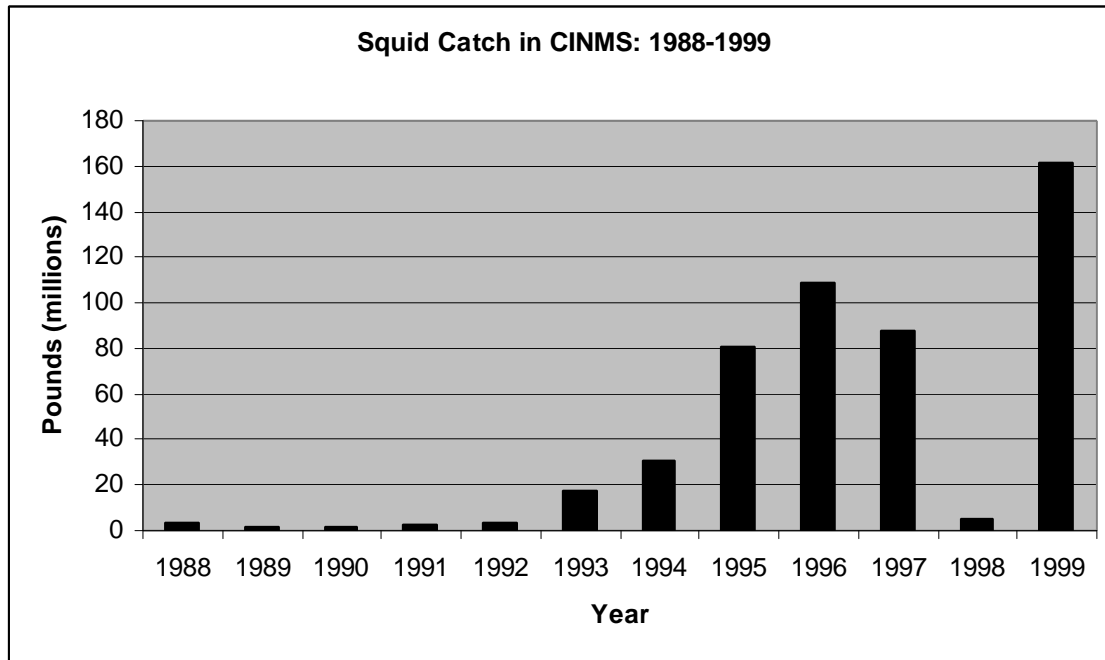


PCW20010417

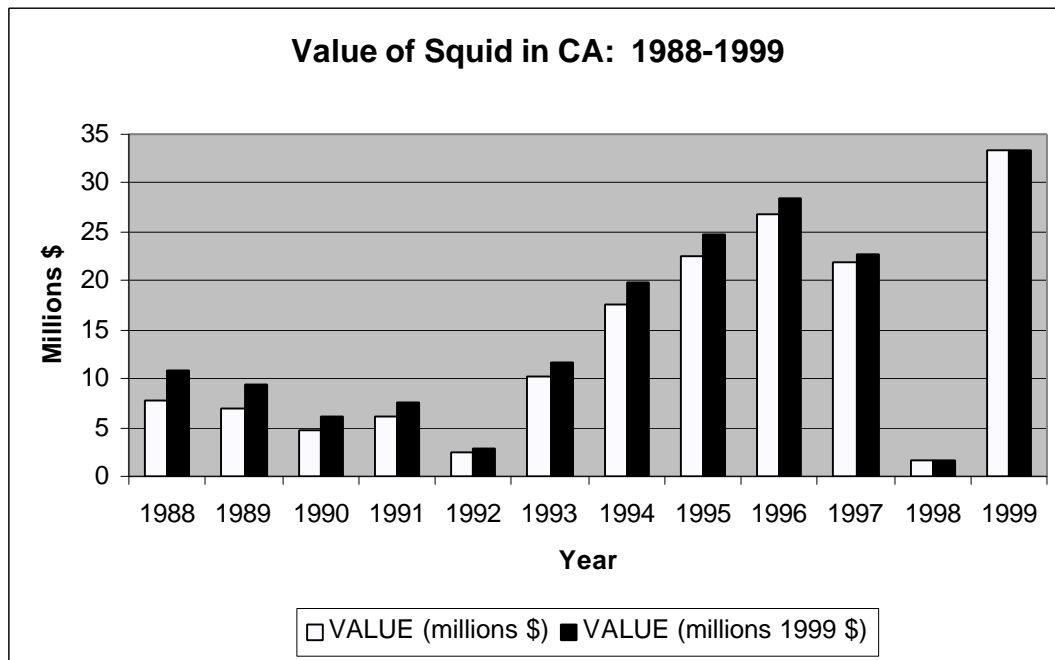
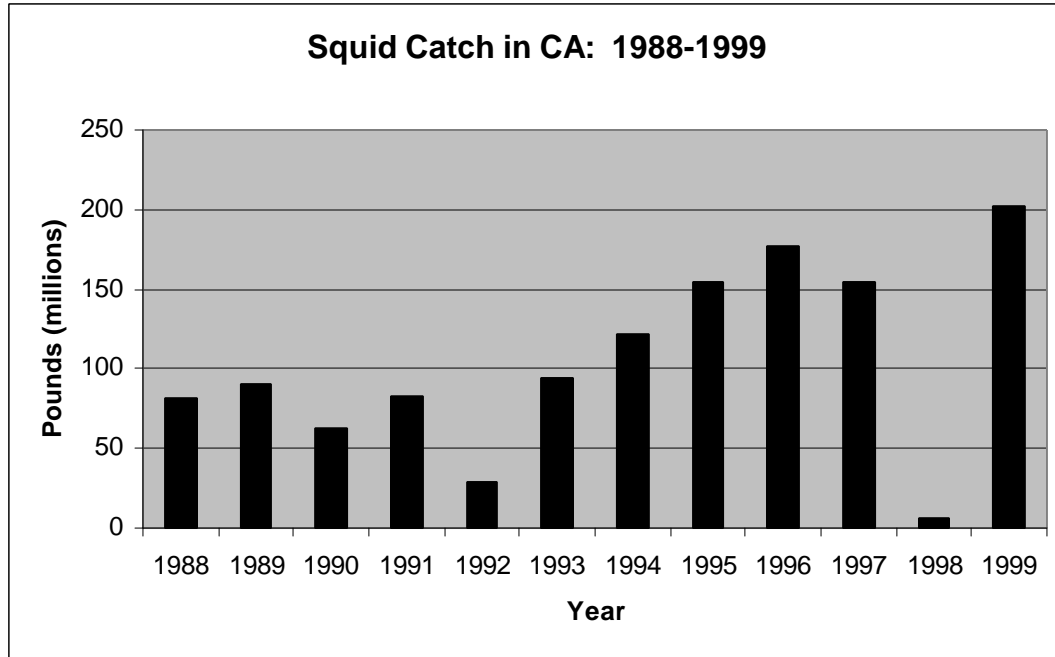
## APPENDIX C



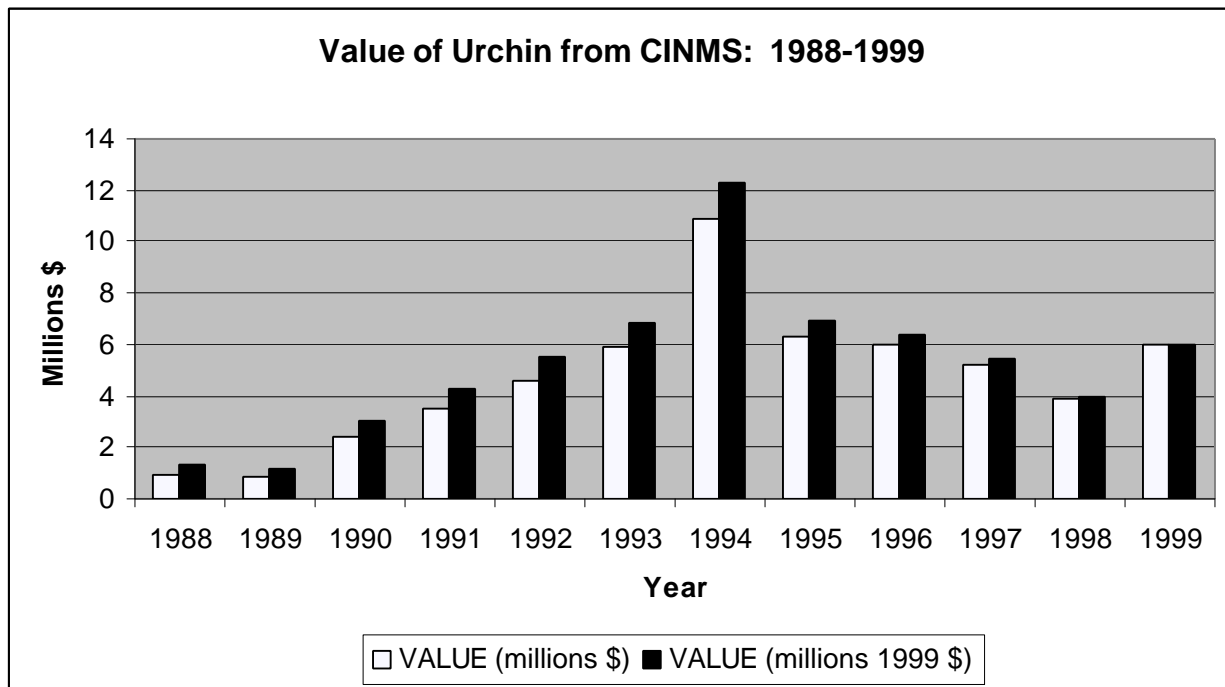
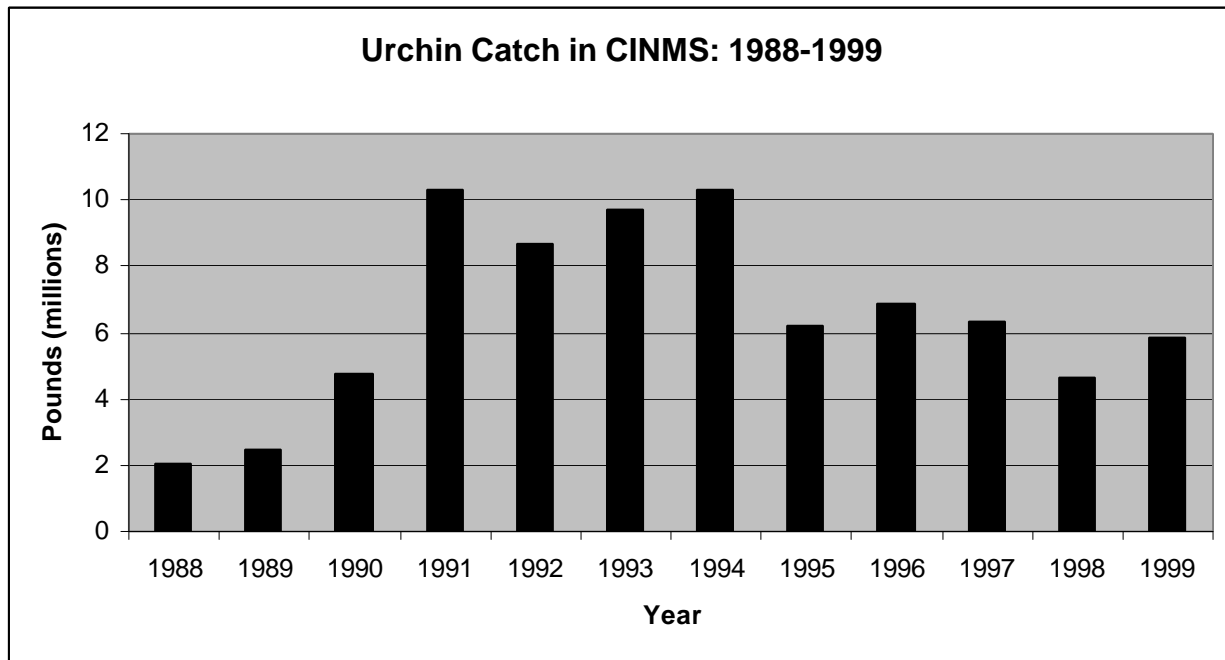
## APPENDIX C



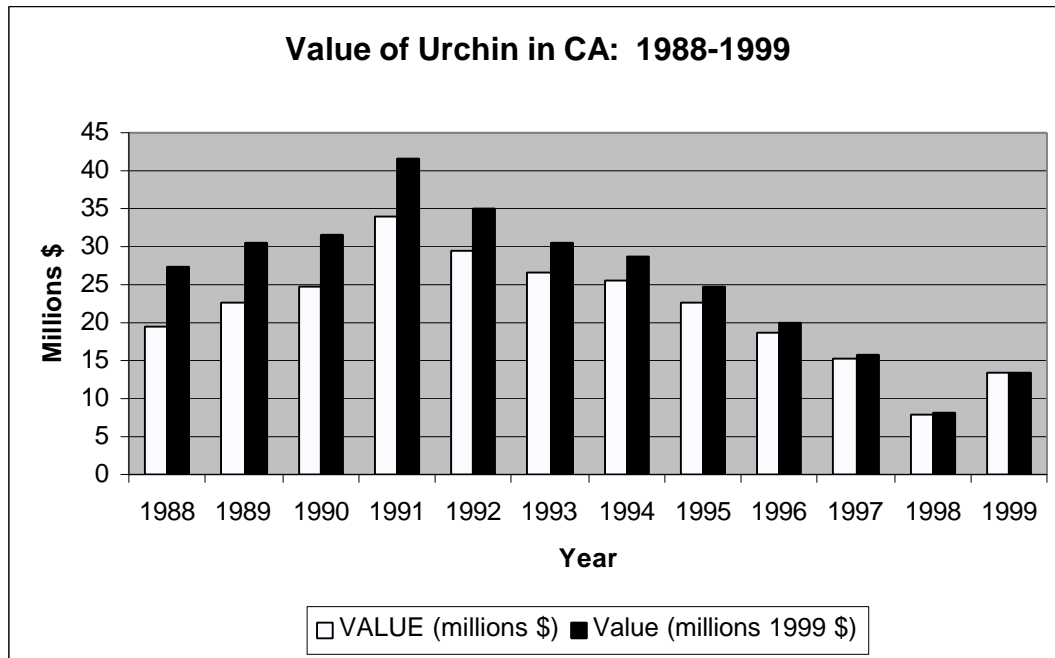
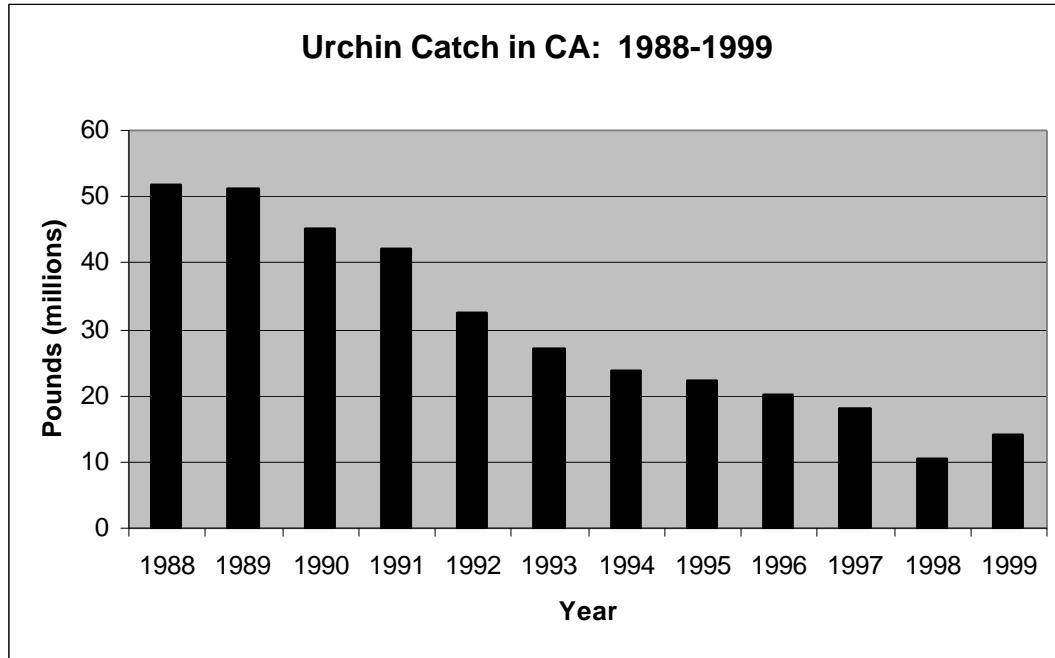
## APPENDIX C



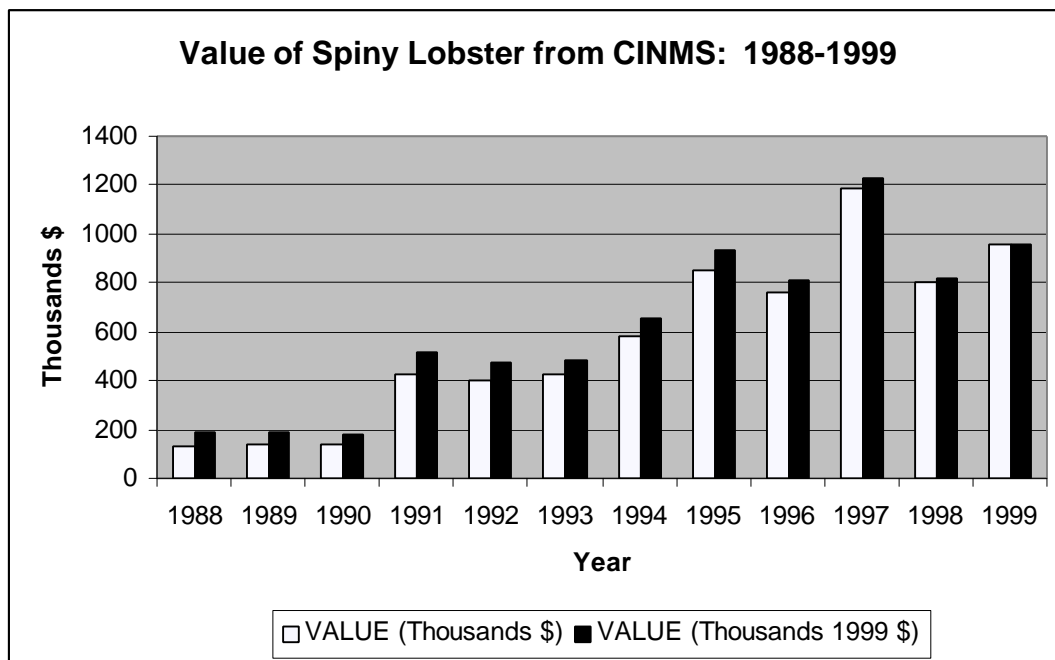
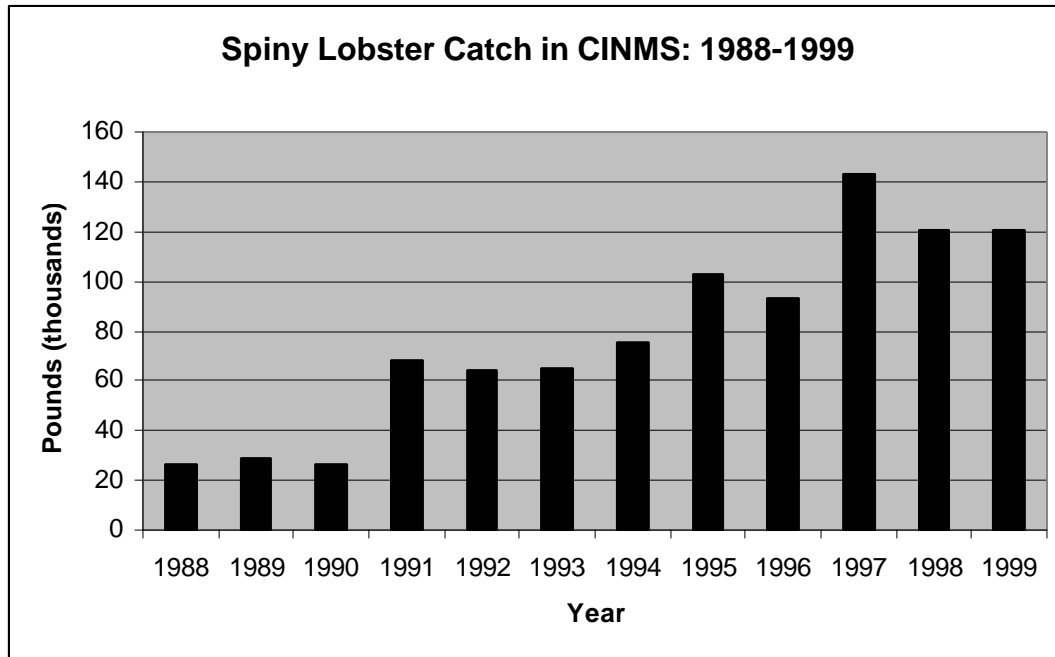
## APPENDIX C



## APPENDIX C

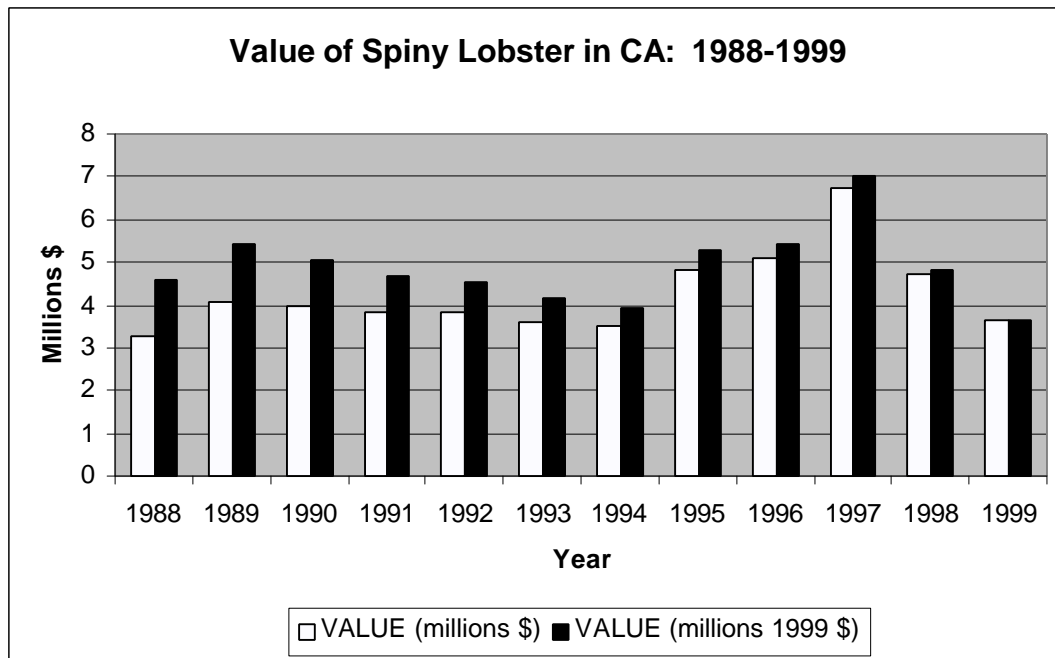
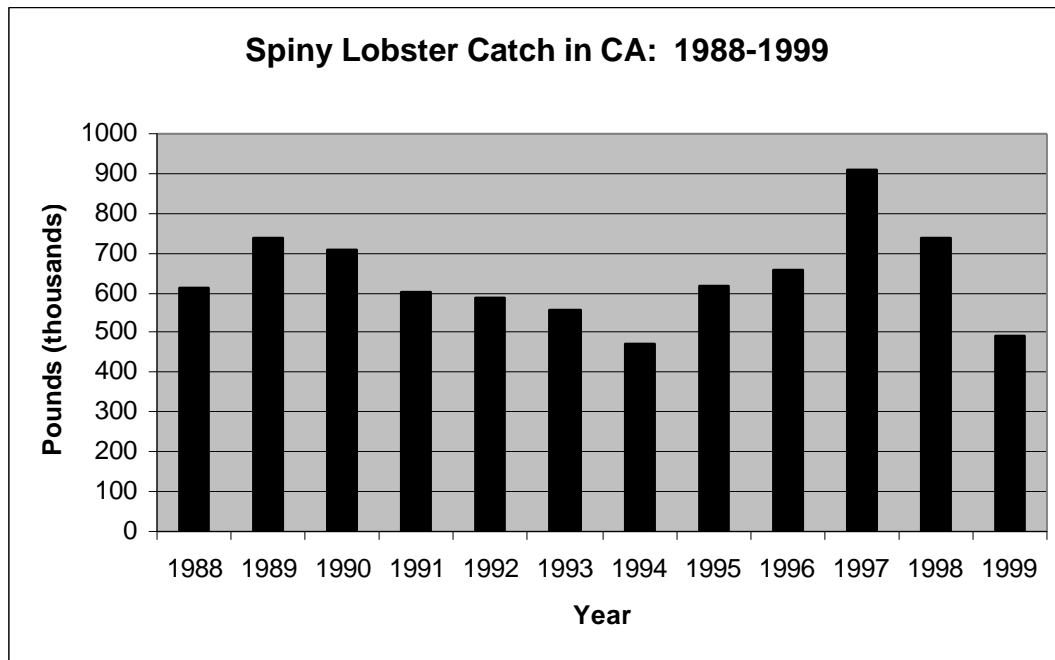


## APPENDIX C

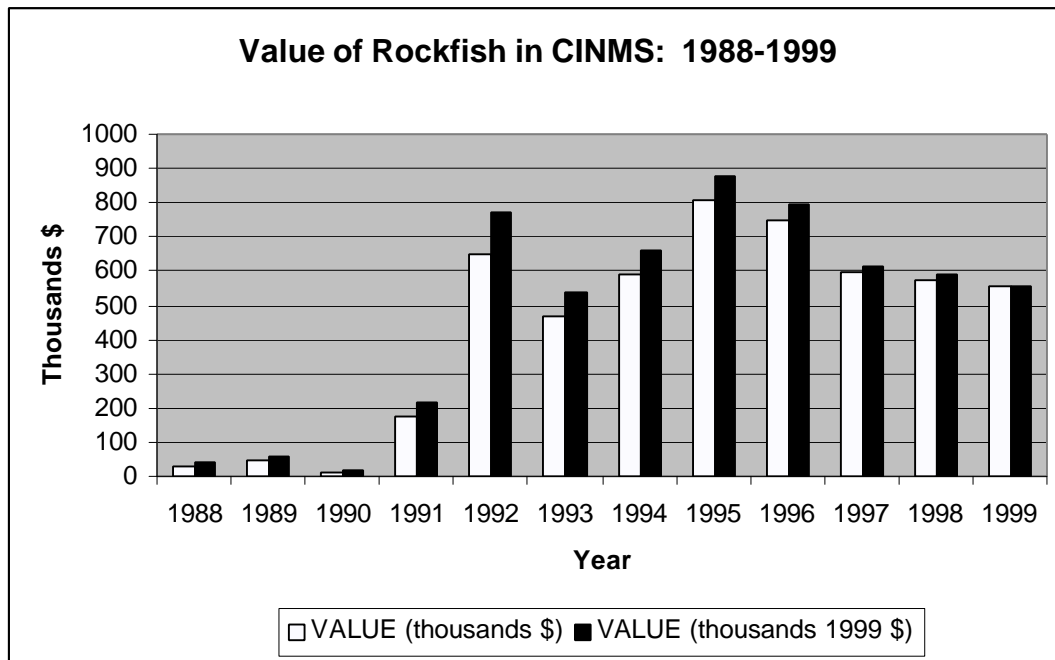
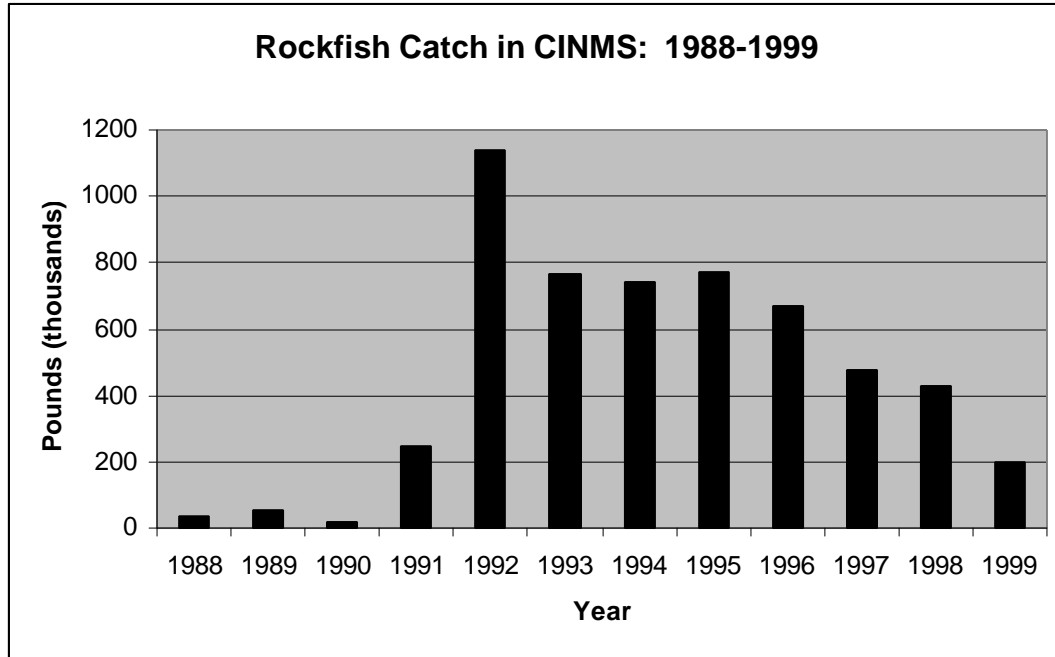




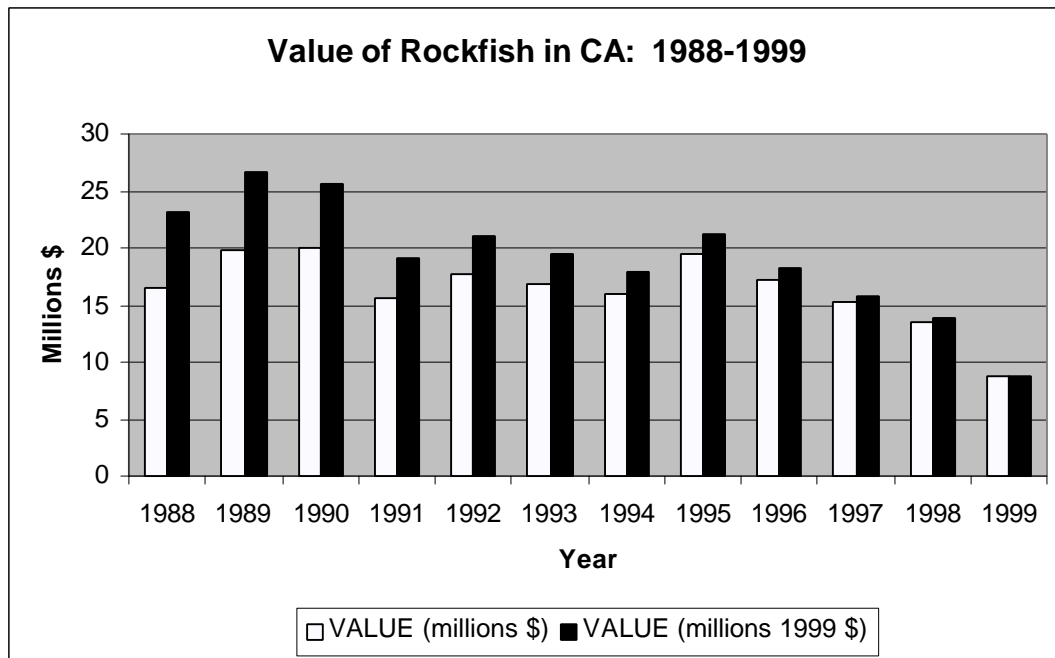
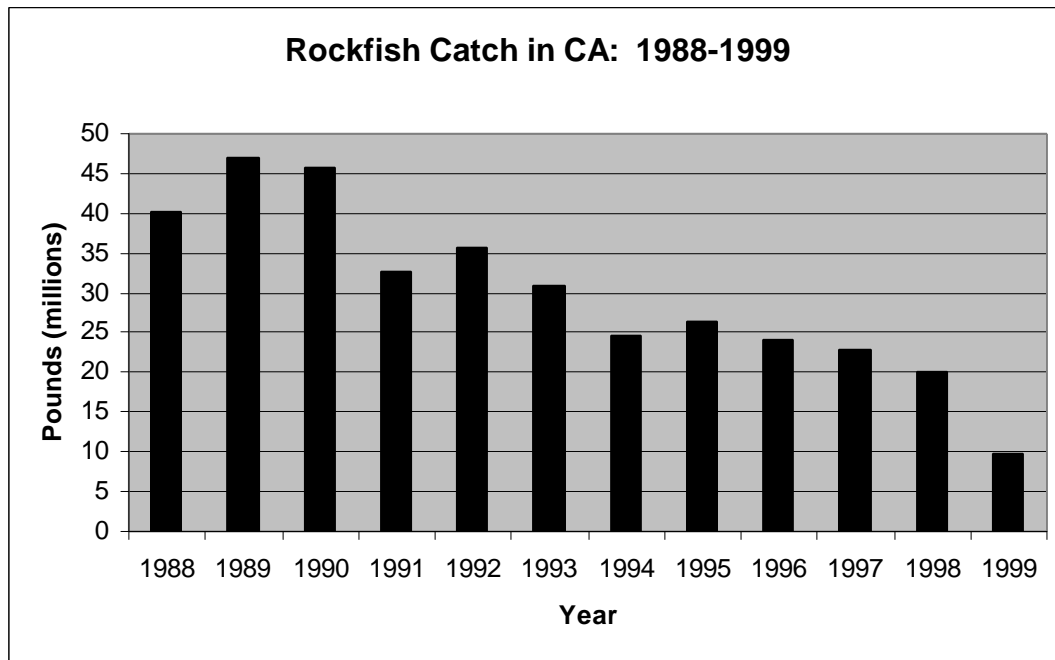
## APPENDIX C



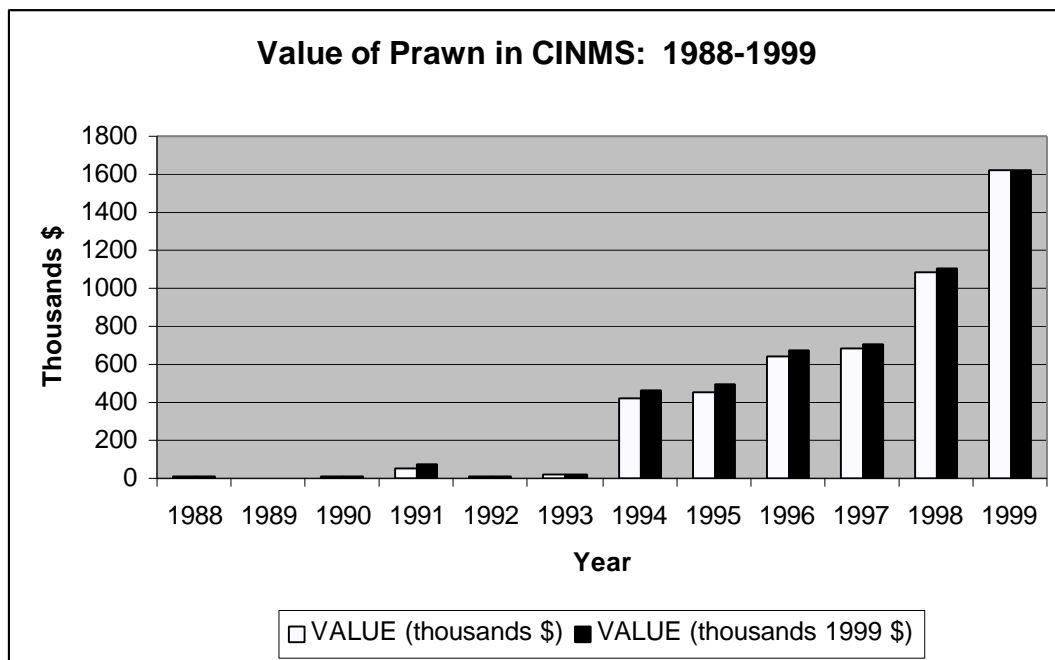
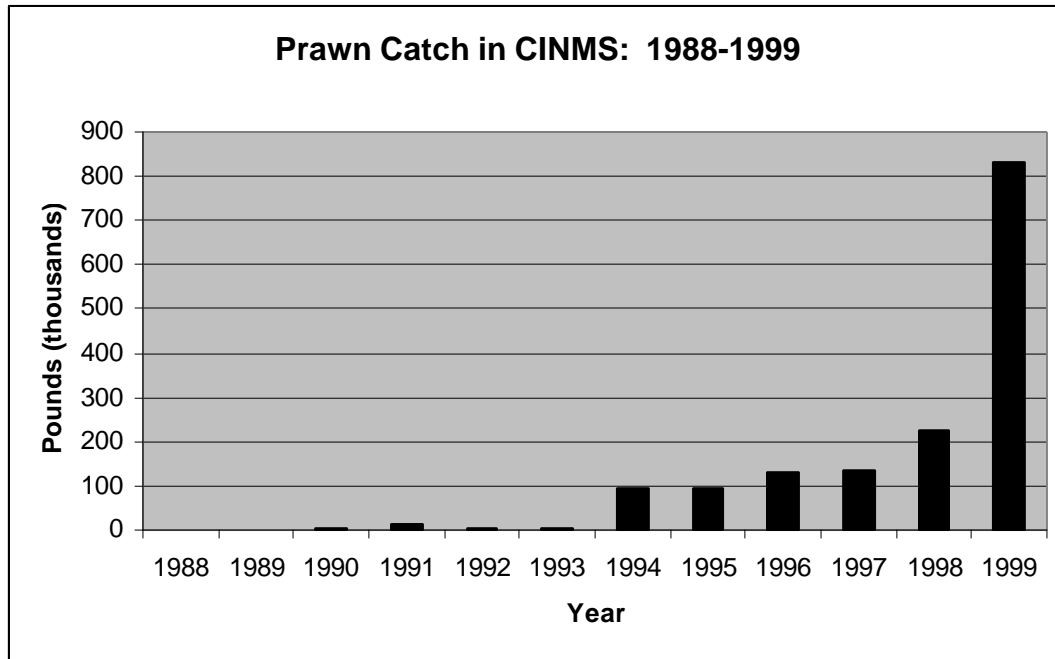
## APPENDIX C



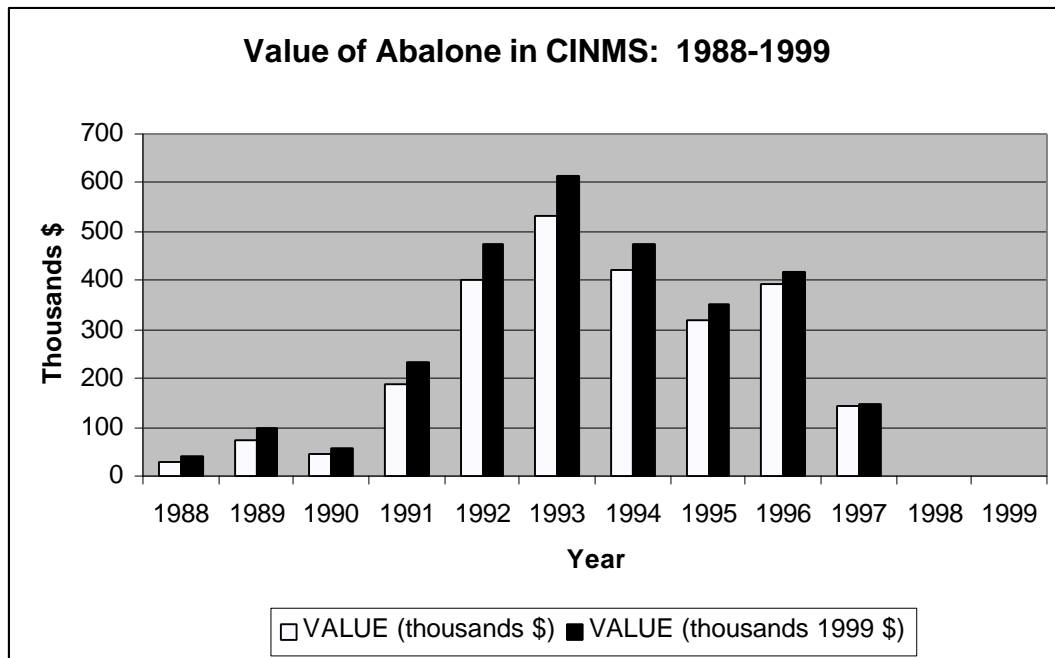
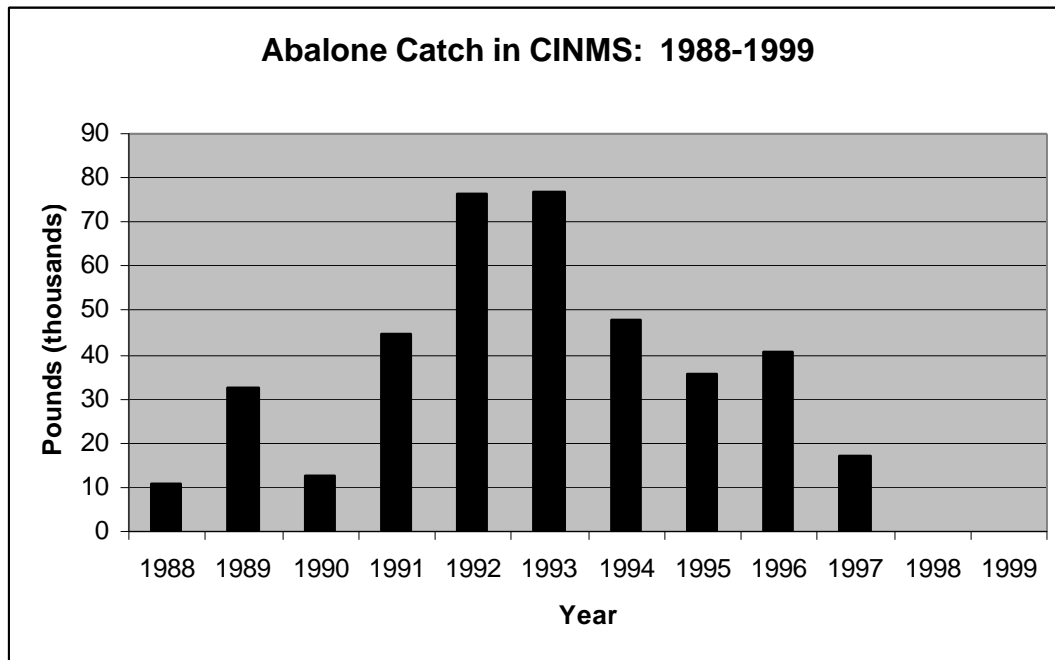
## APPENDIX C



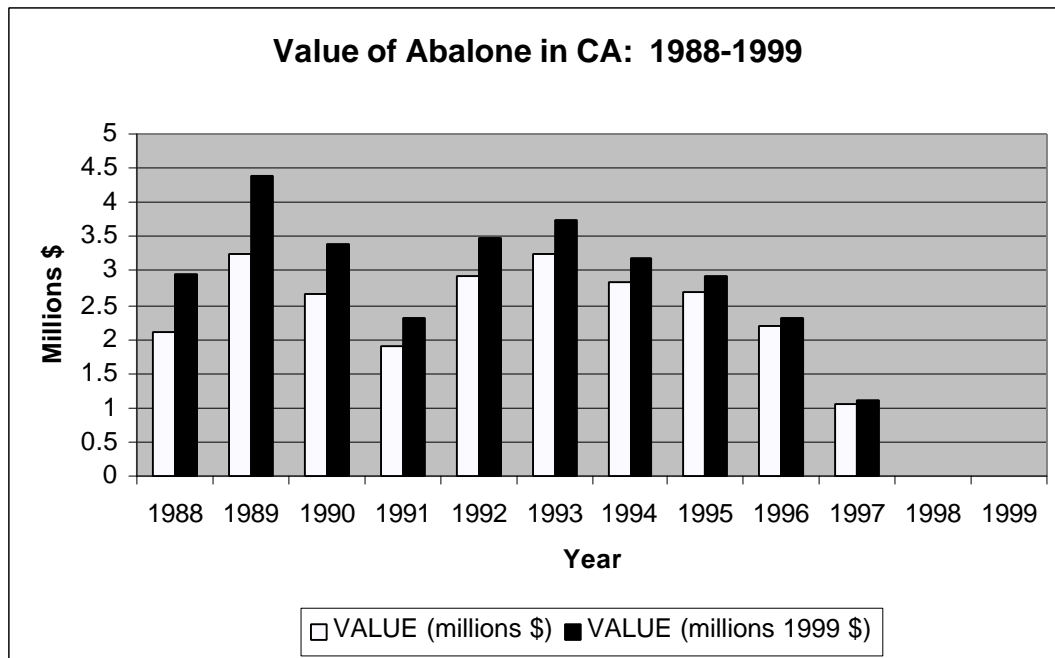
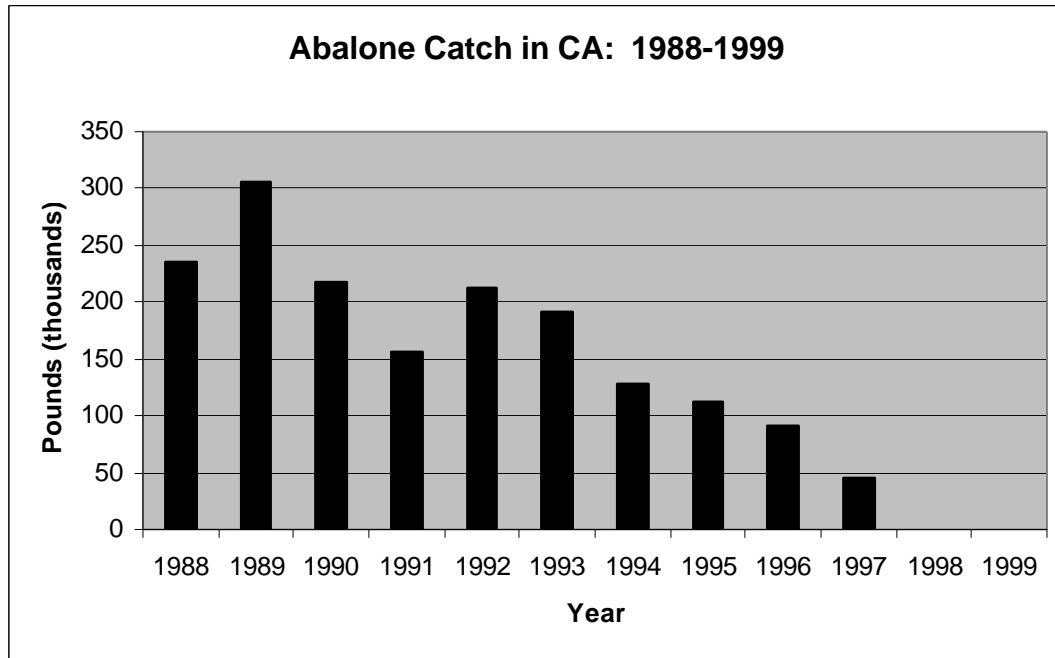
## APPENDIX C



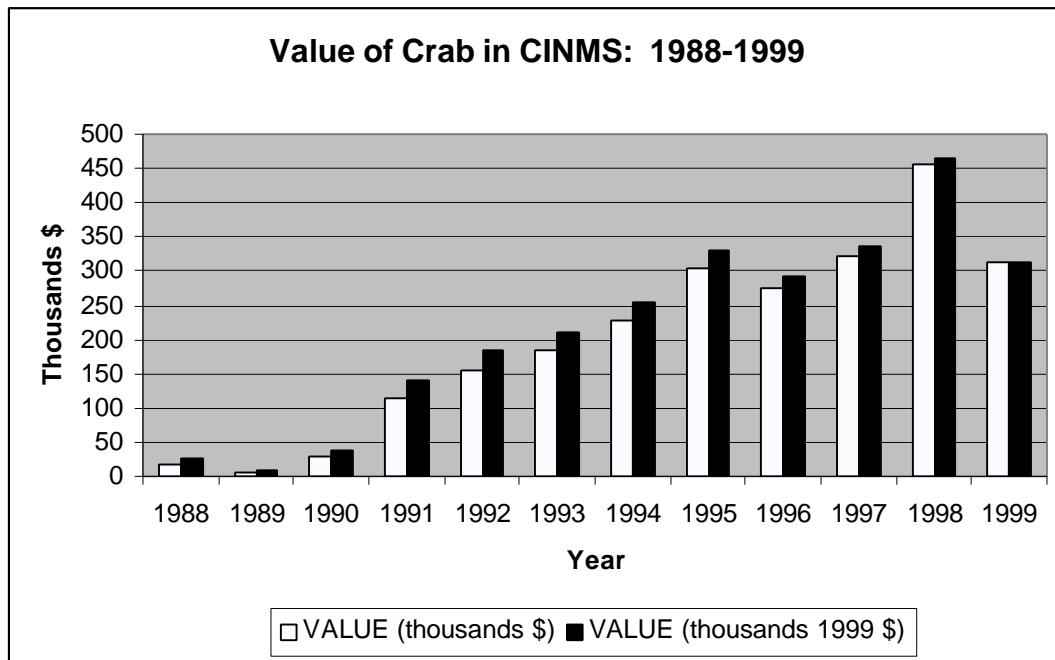
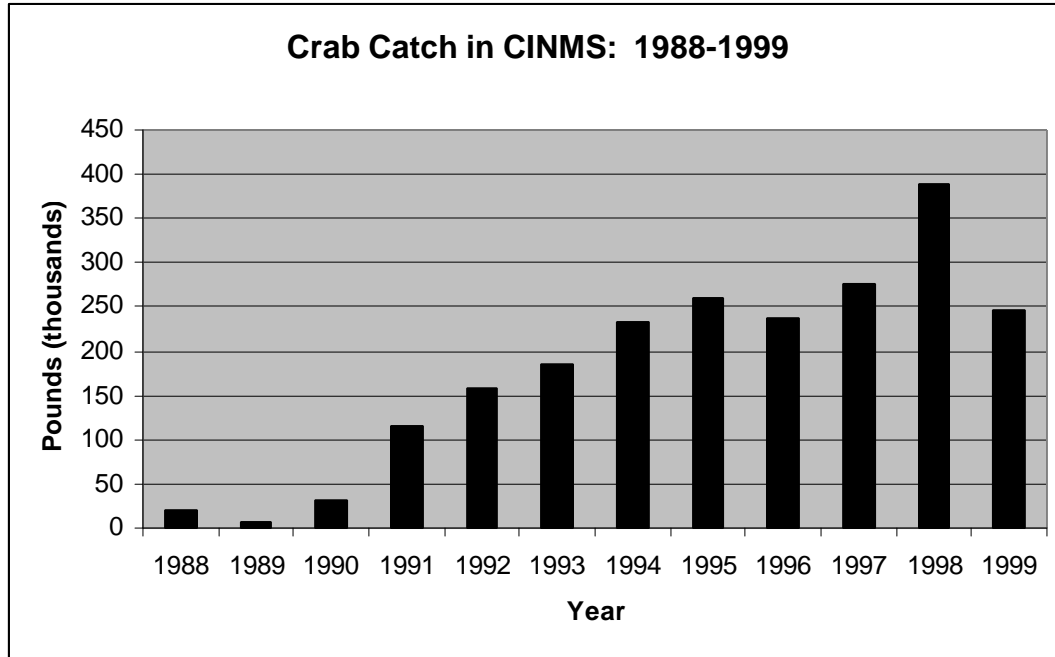
## APPENDIX C



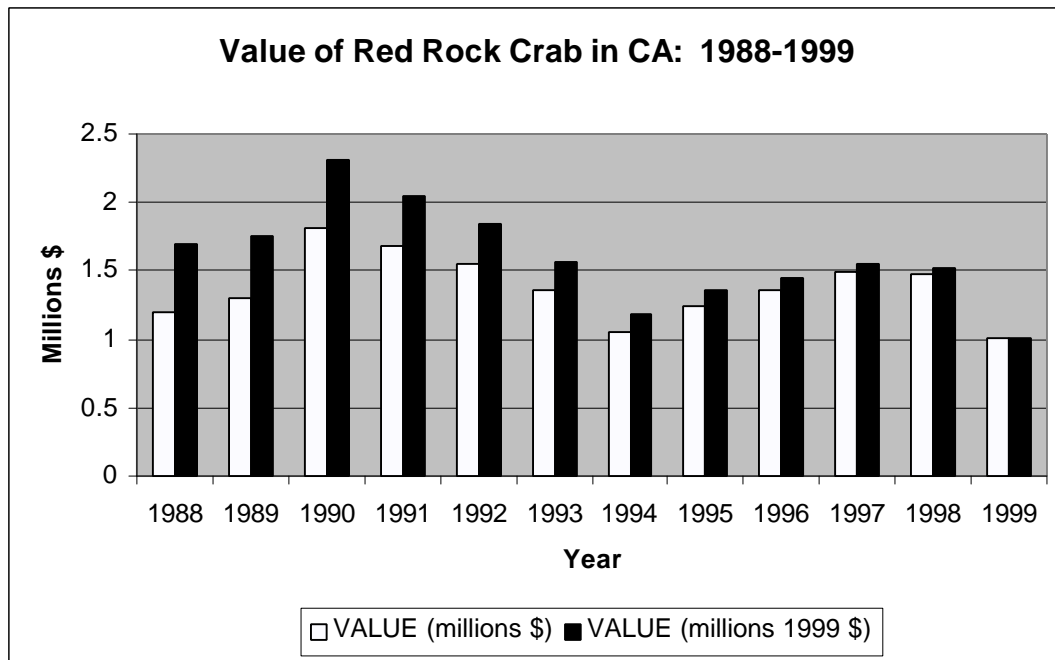
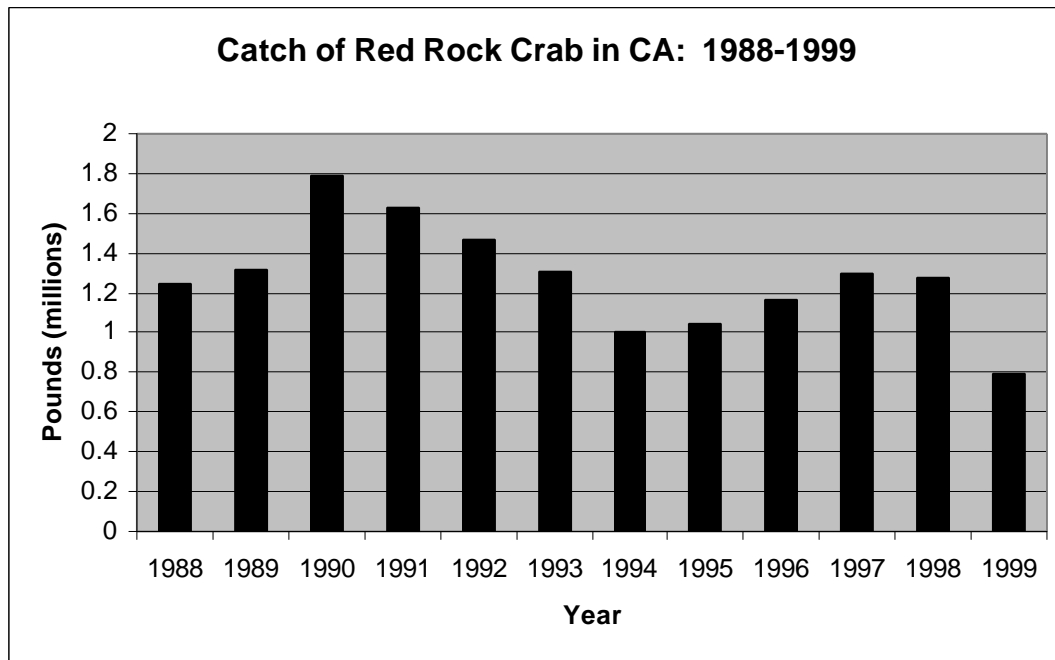
## APPENDIX C



## APPENDIX C

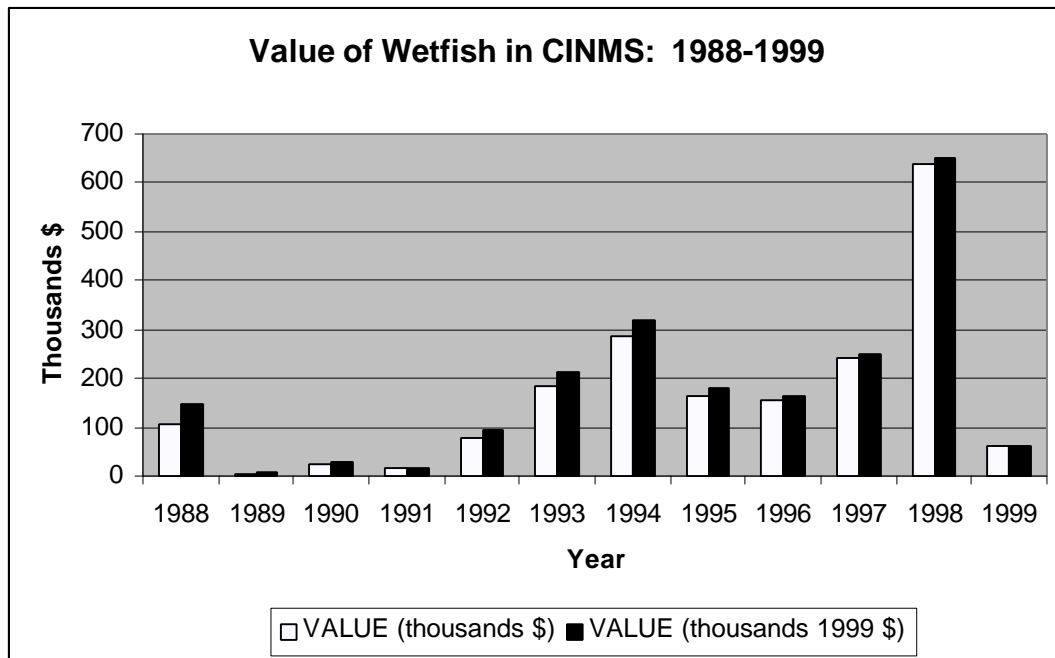
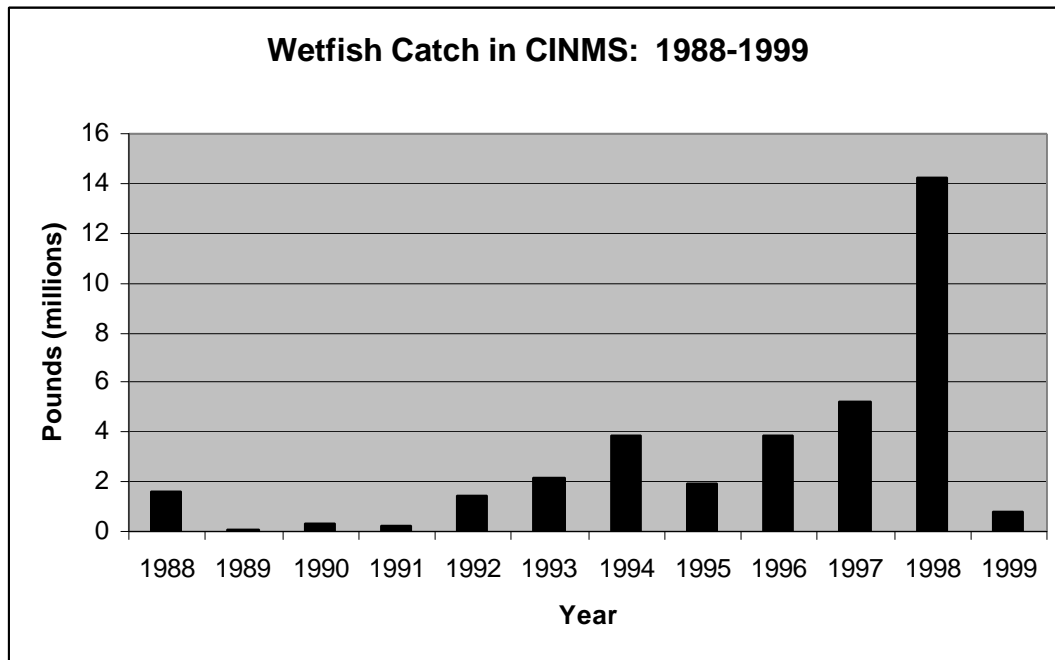


## APPENDIX C

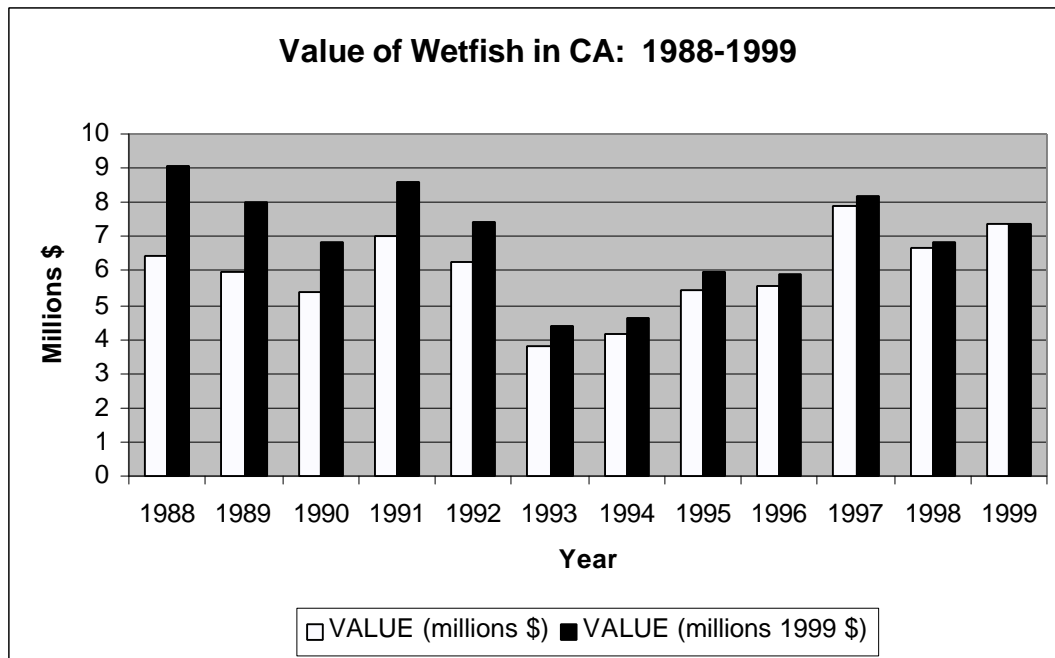
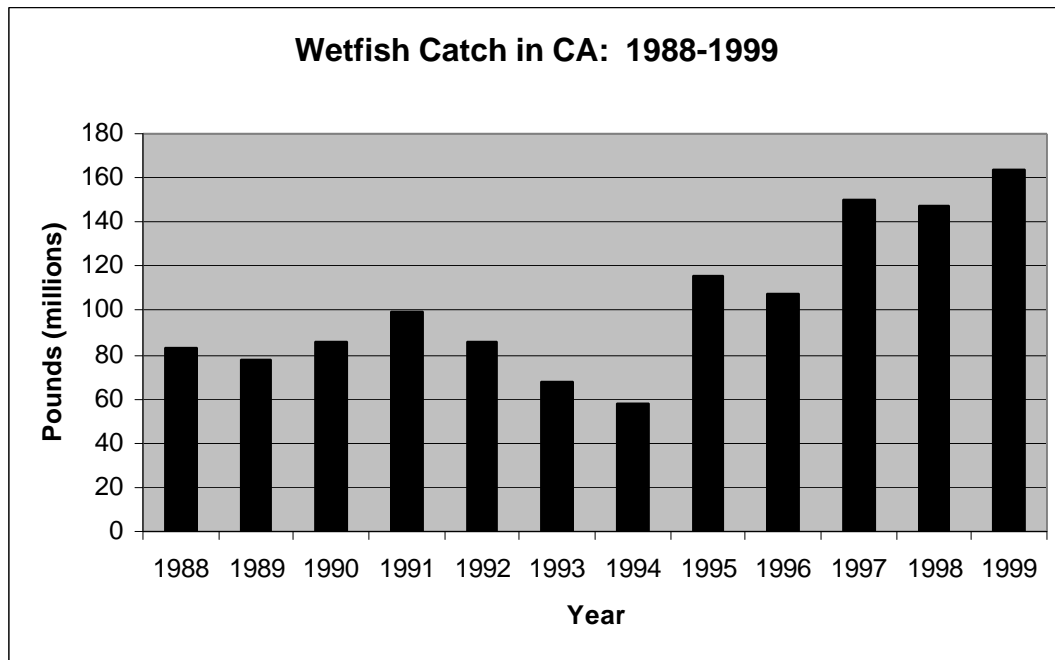




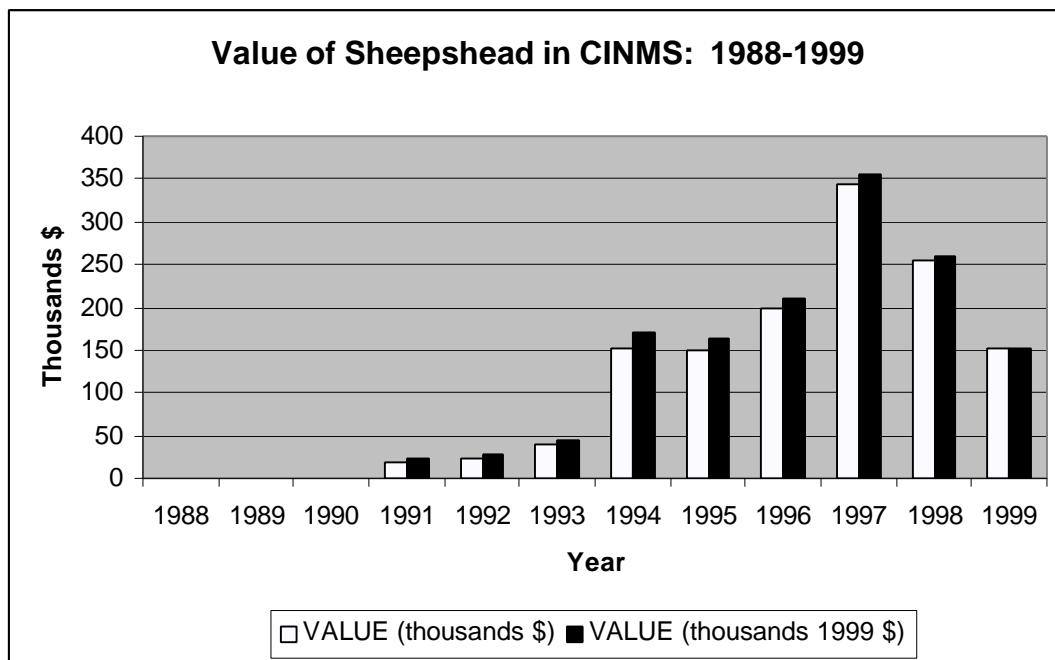
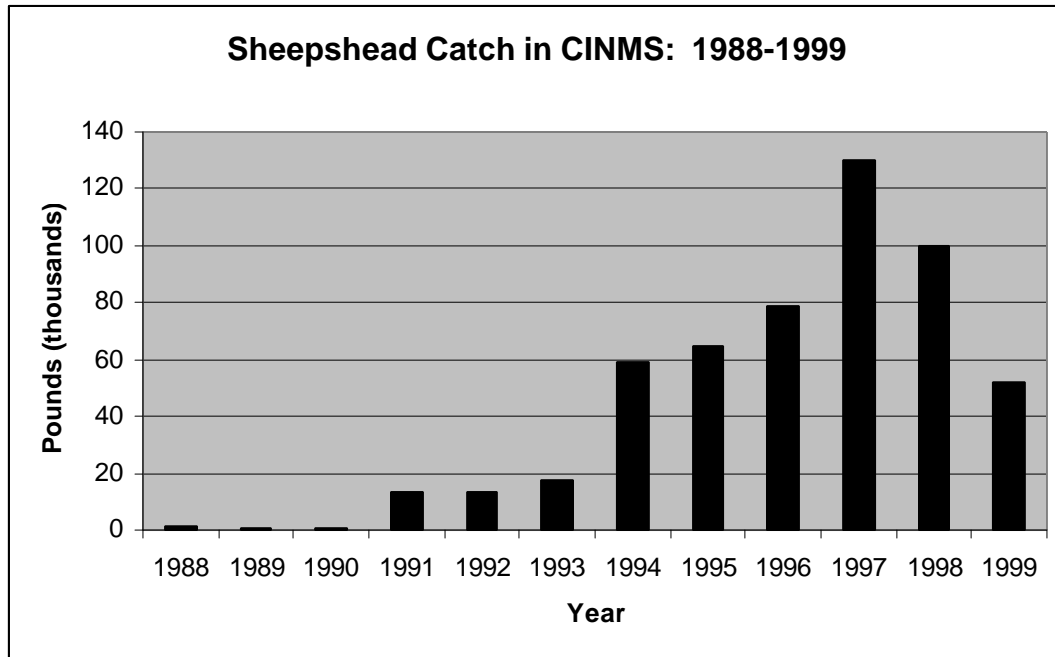
## APPENDIX C



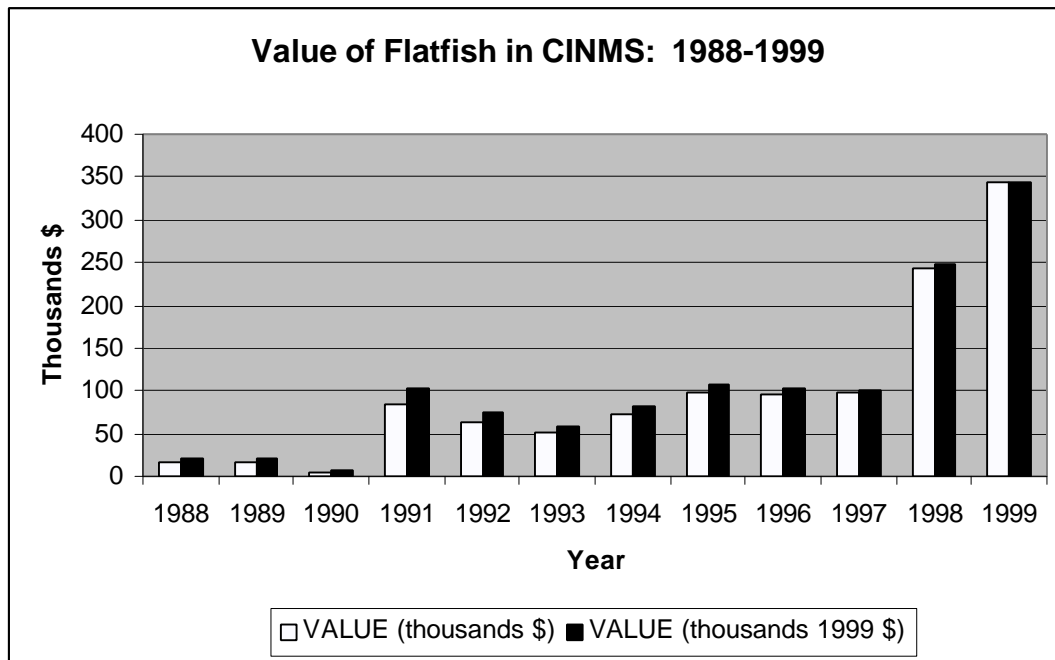
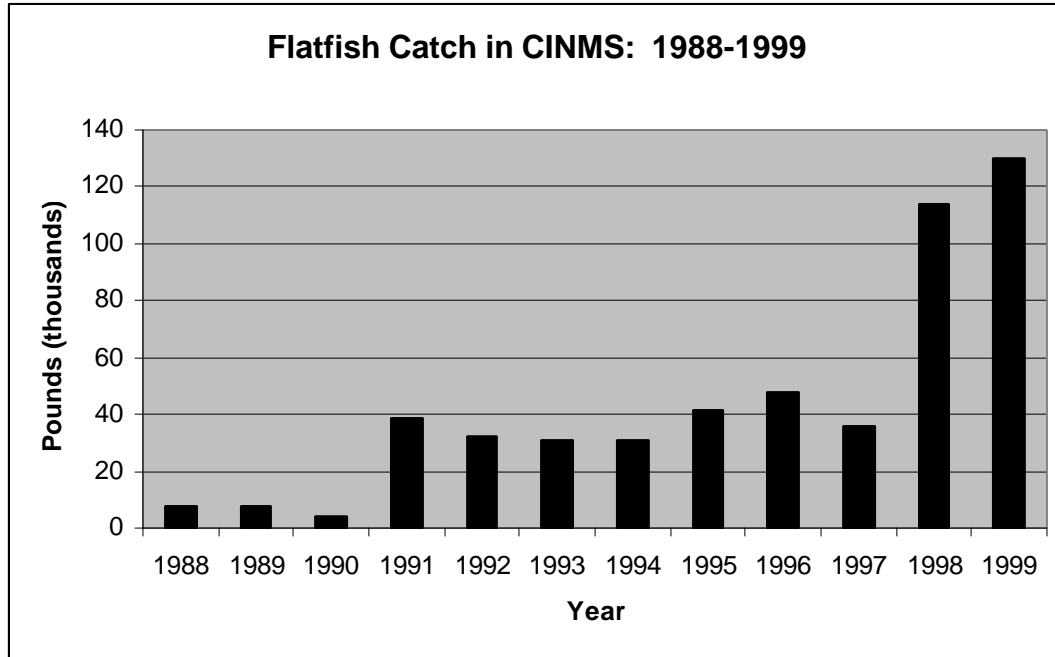
## APPENDIX C



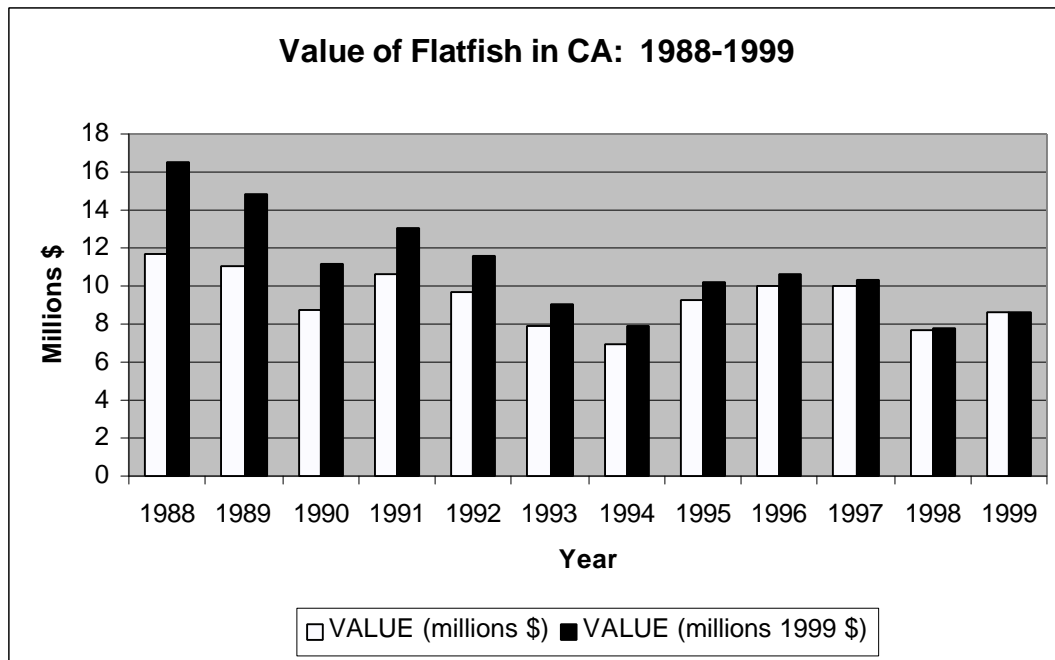
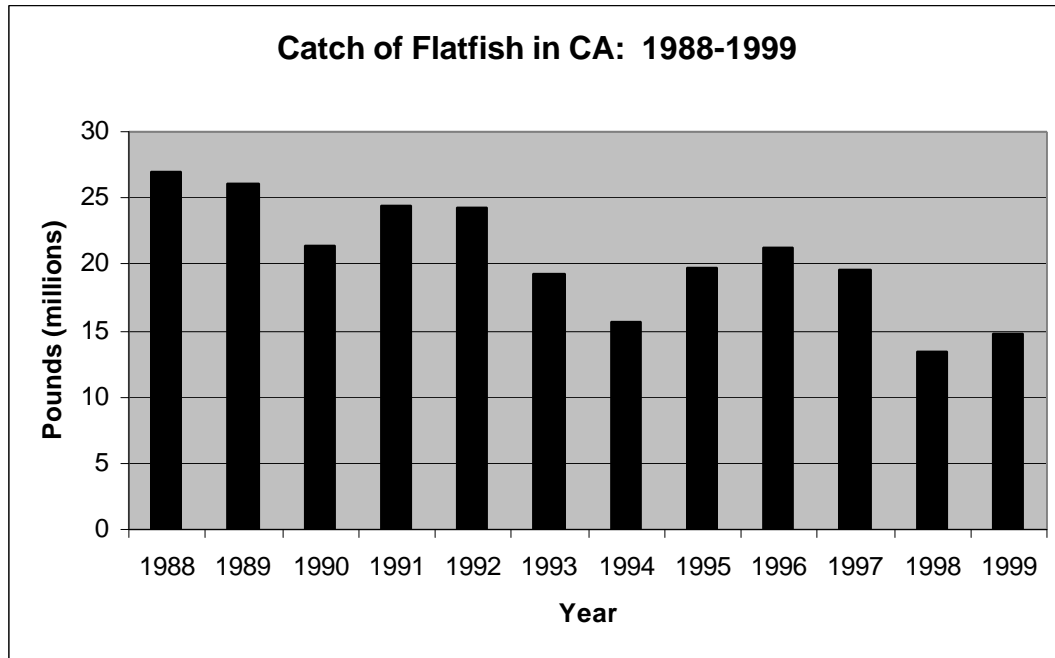
## APPENDIX C



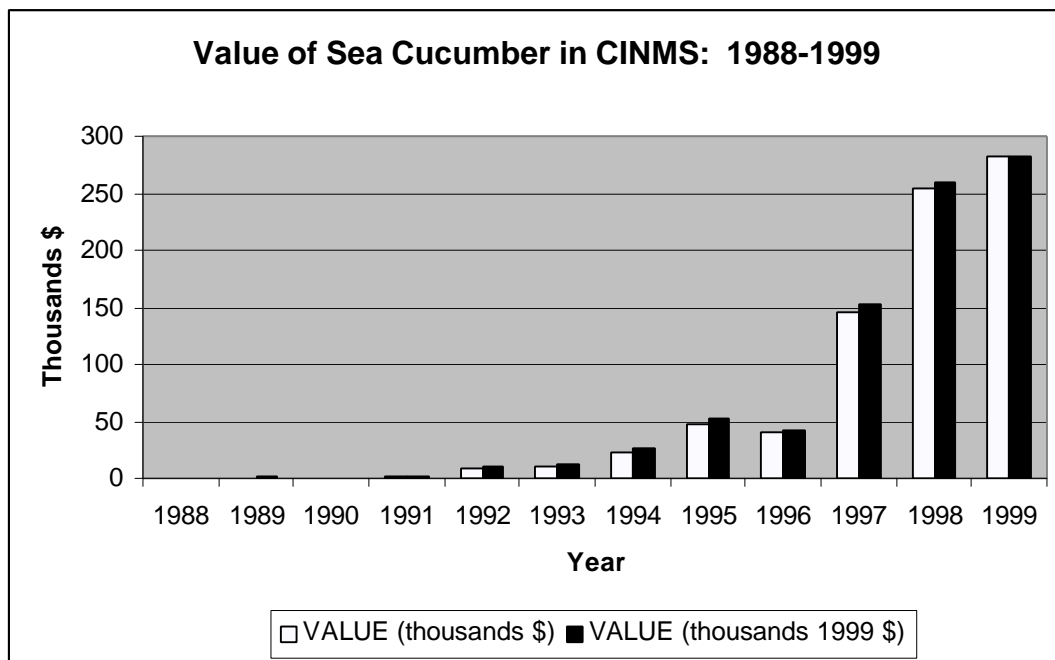
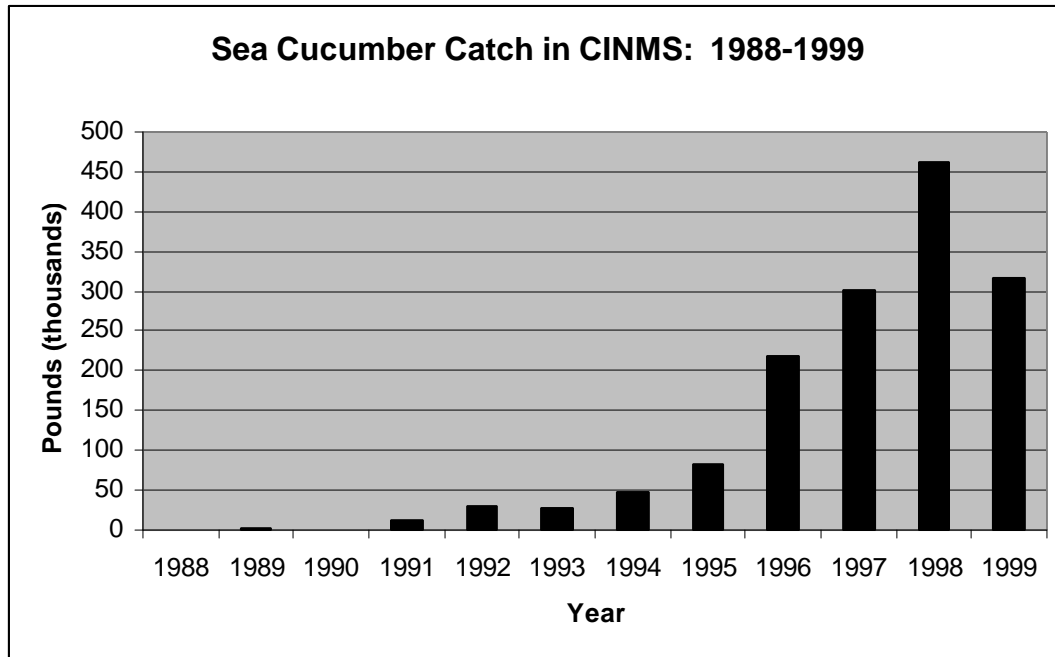
## APPENDIX C



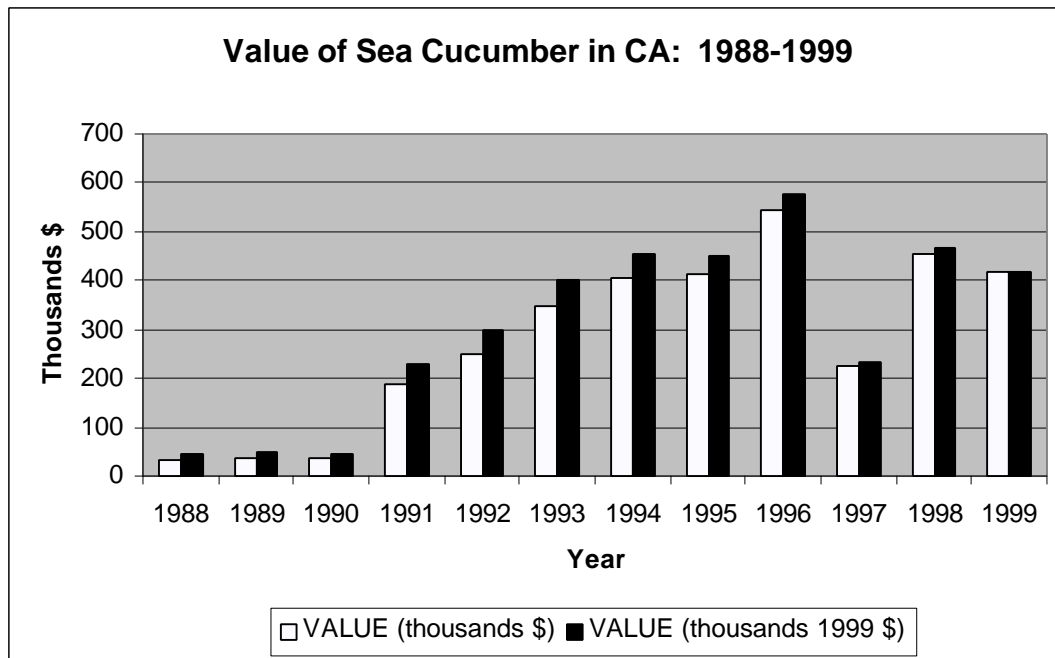
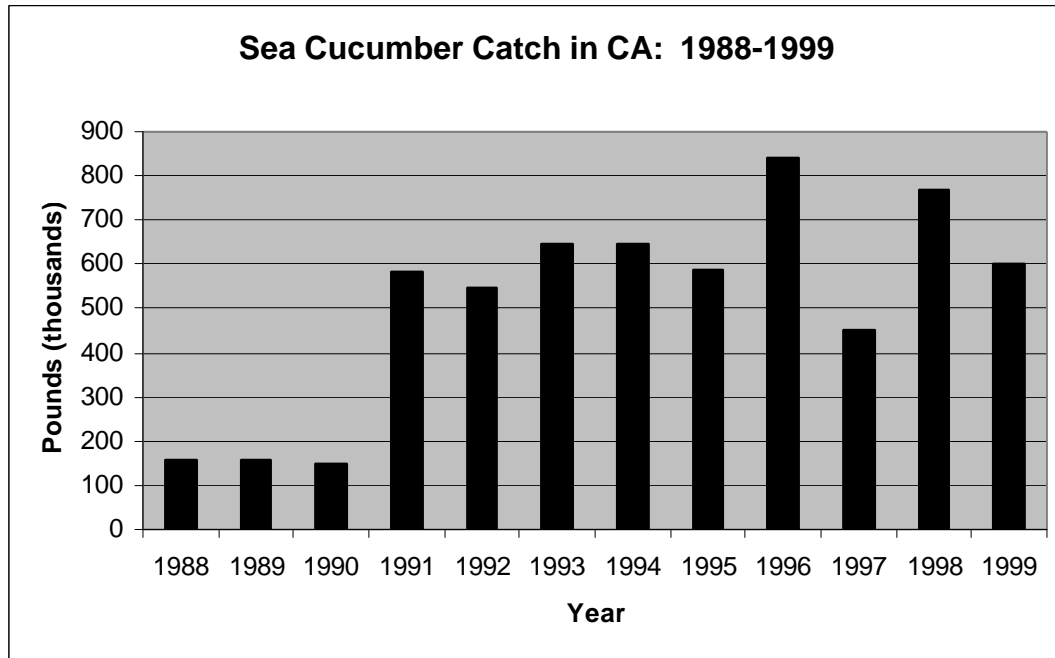
## APPENDIX C



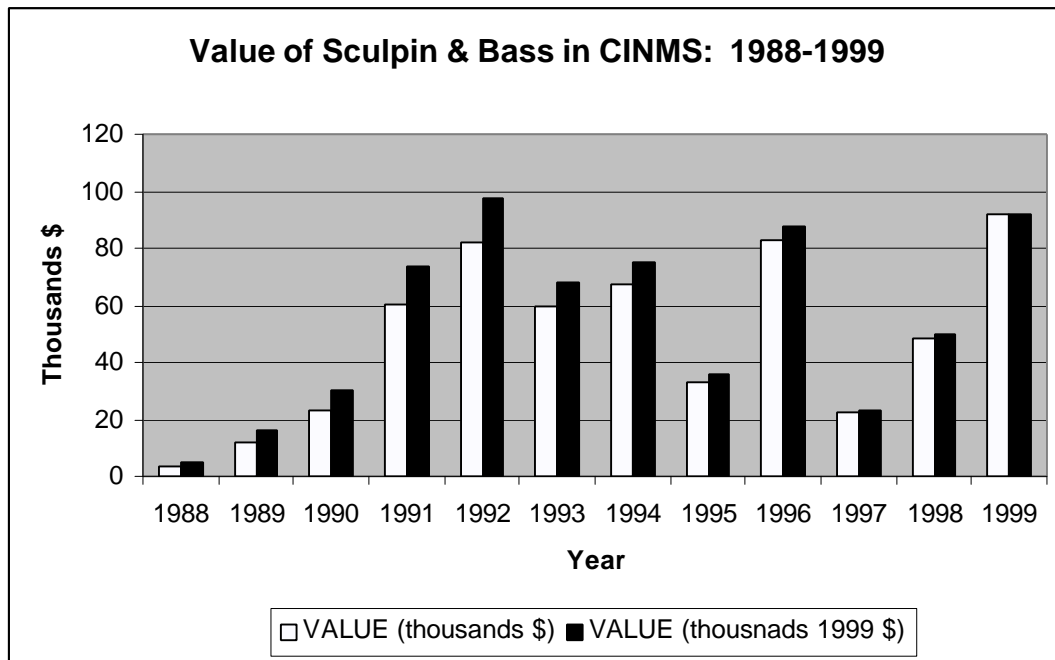
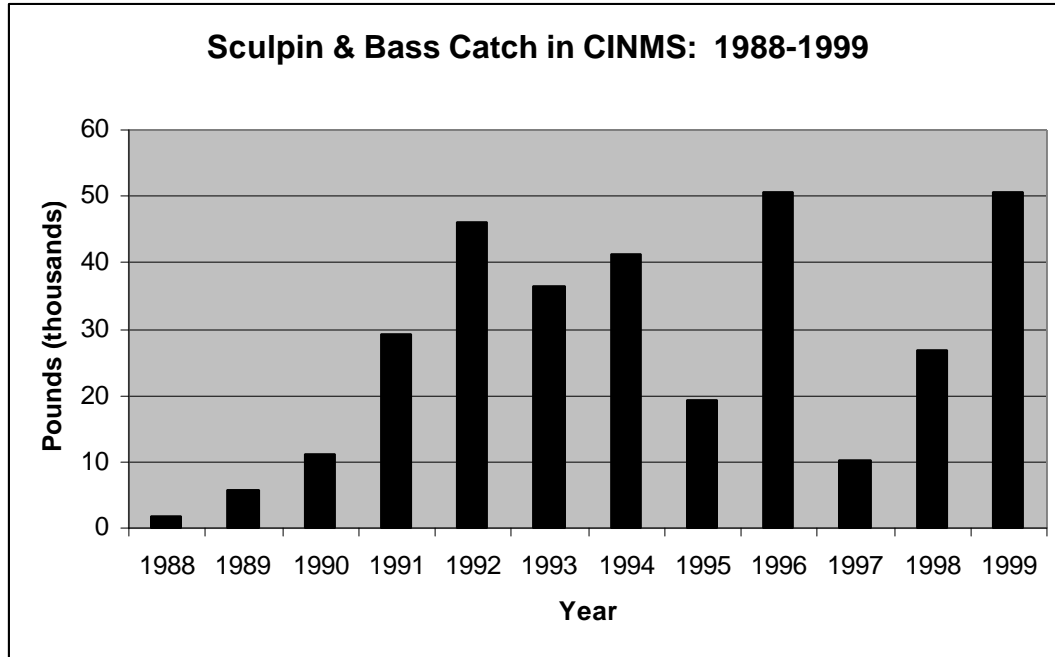
## APPENDIX C



## APPENDIX C

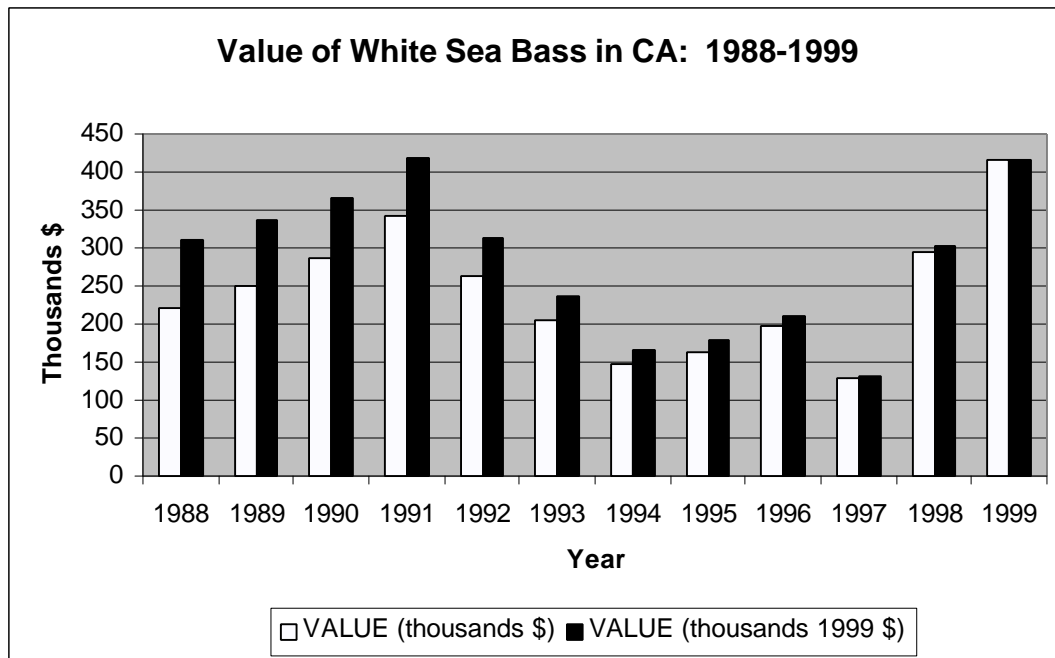
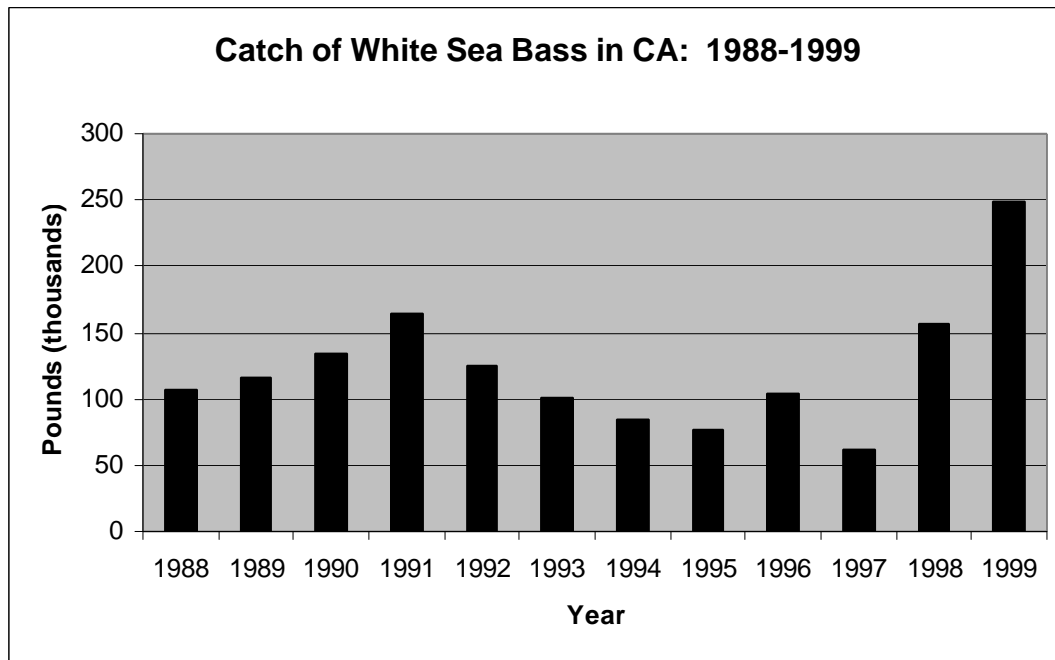


## APPENDIX C

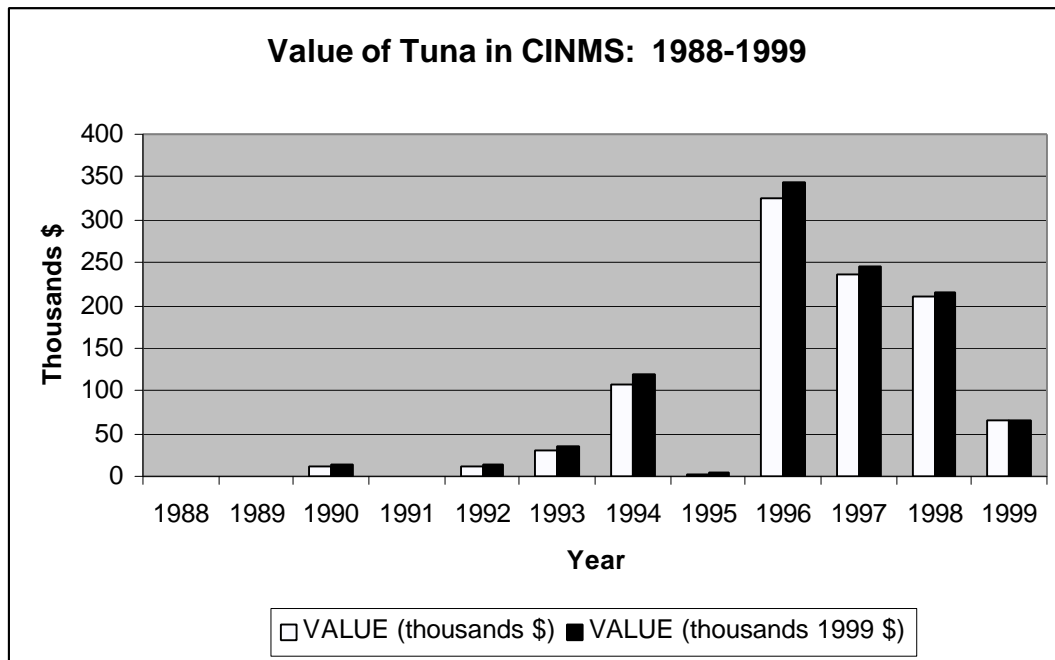
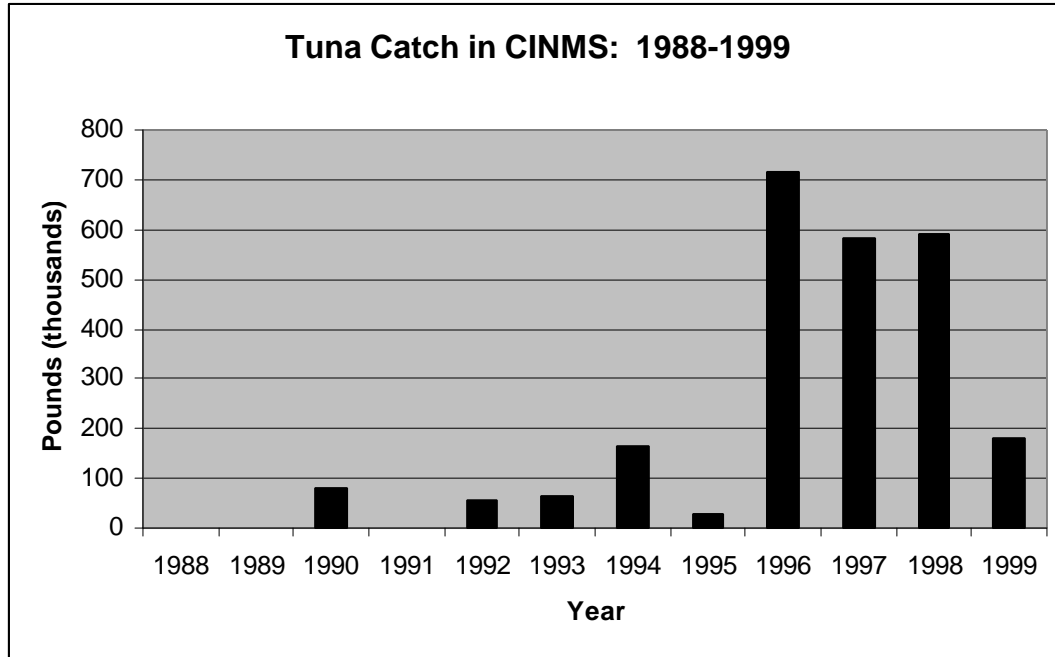




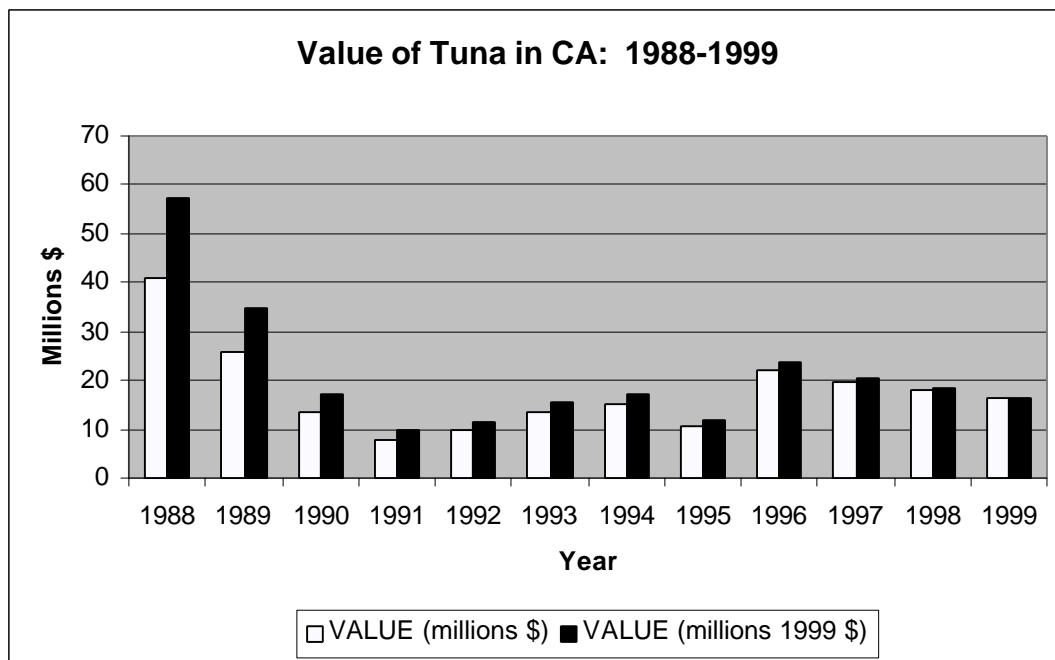
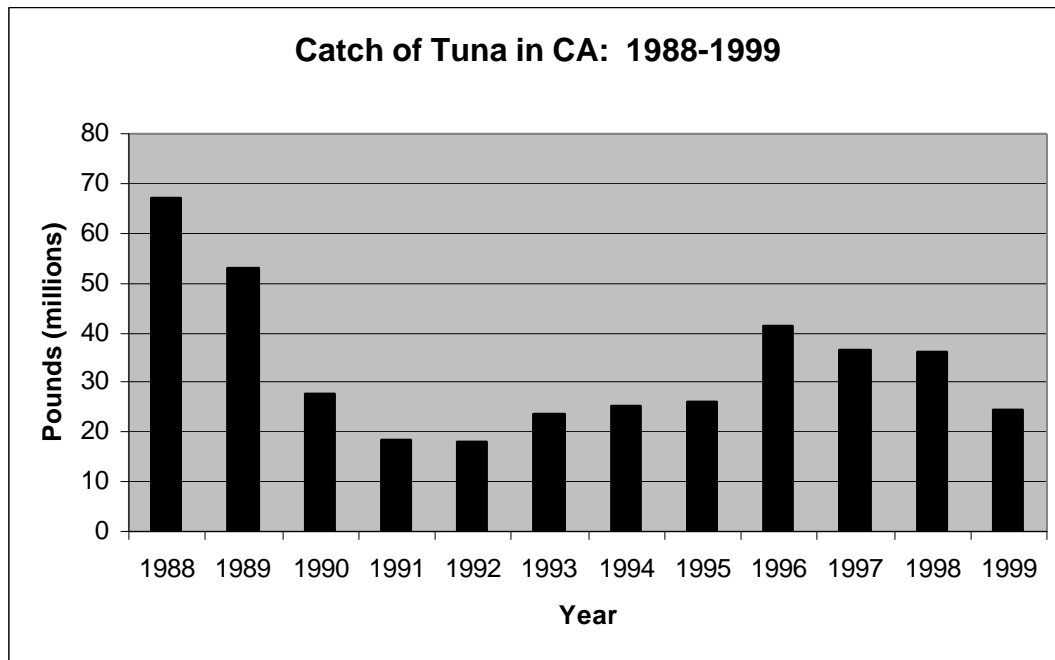
## APPENDIX C



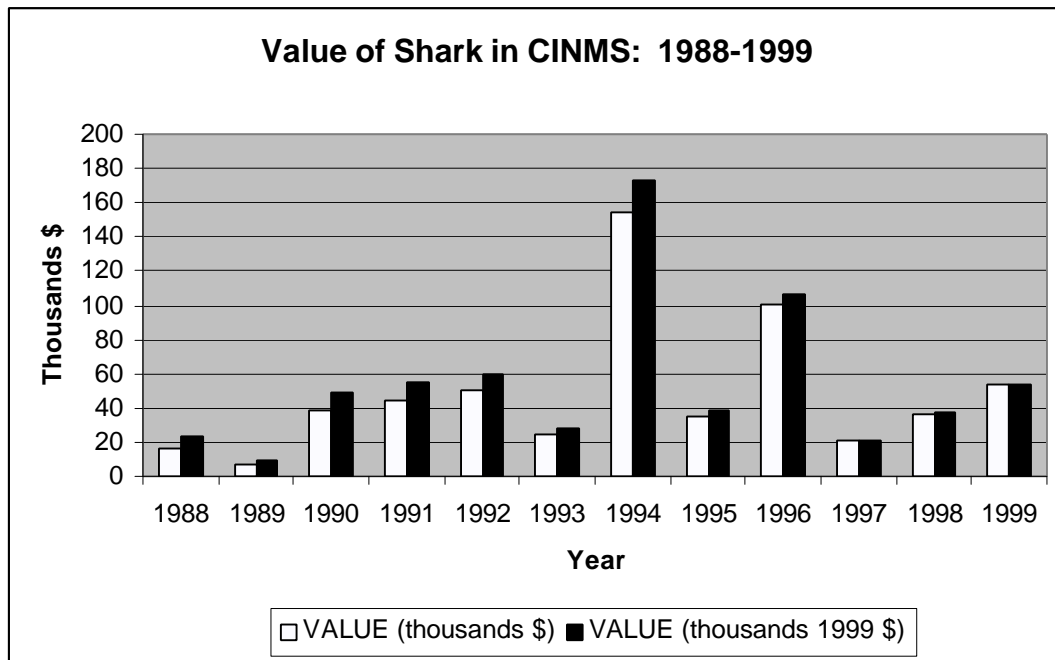
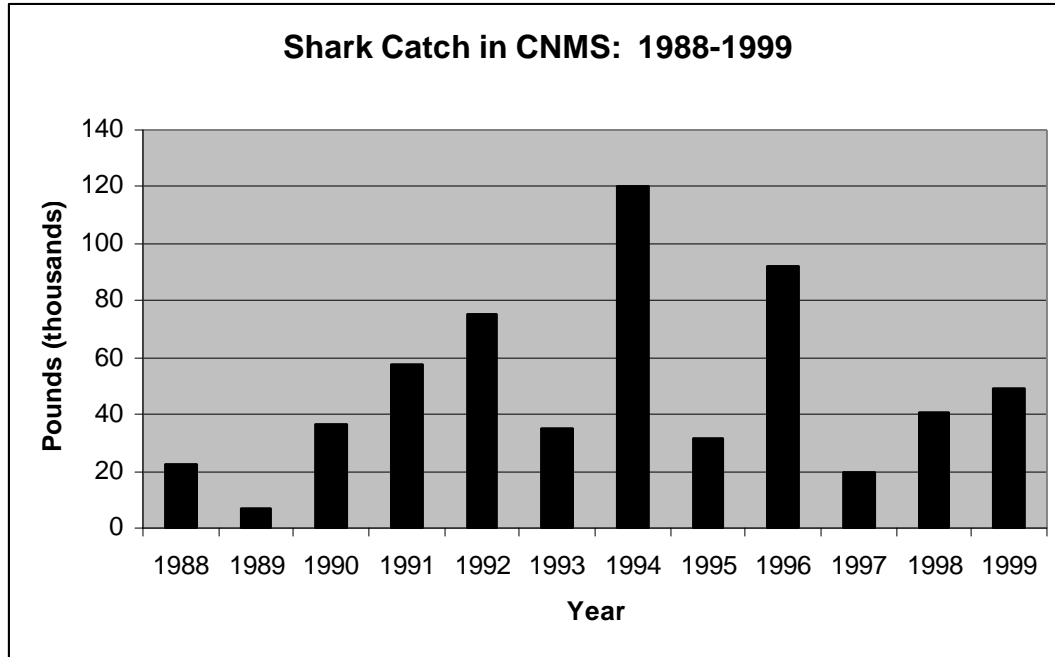
## APPENDIX C



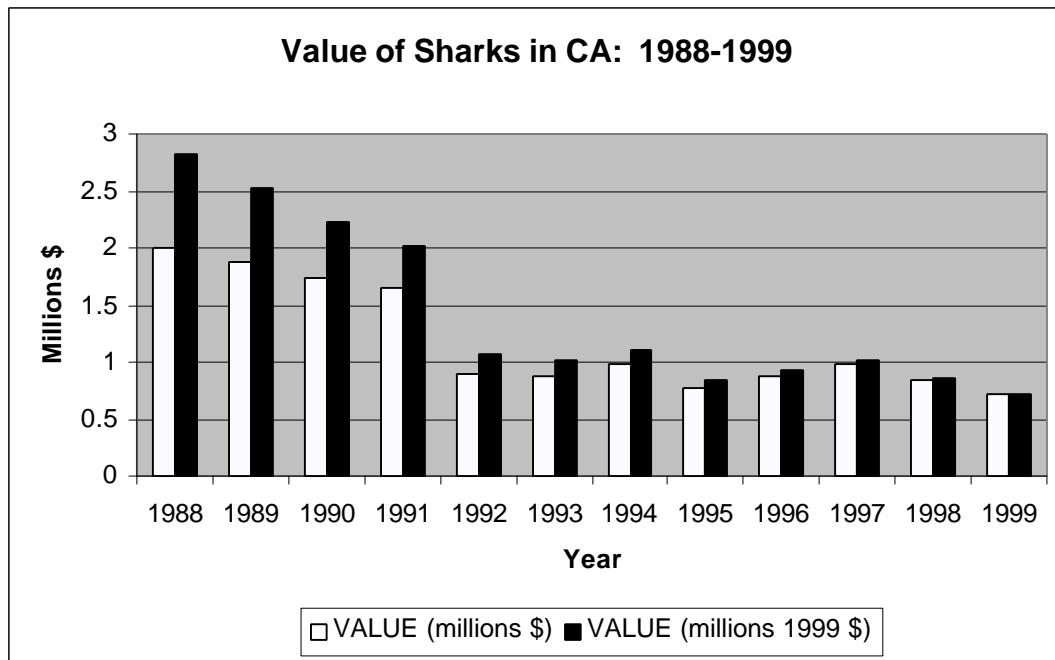
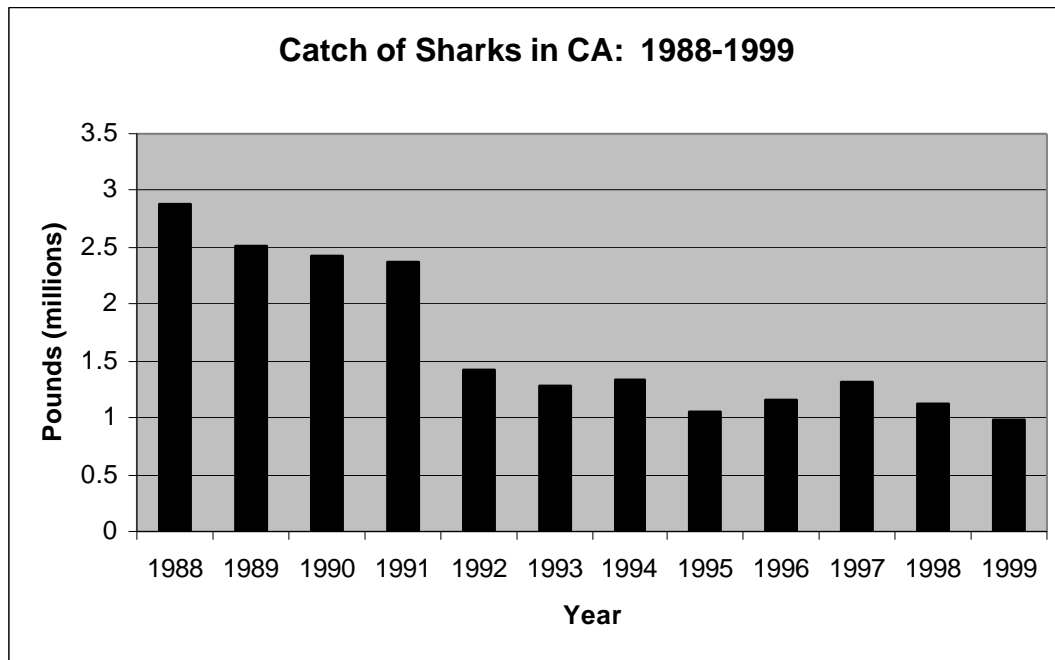
## APPENDIX C



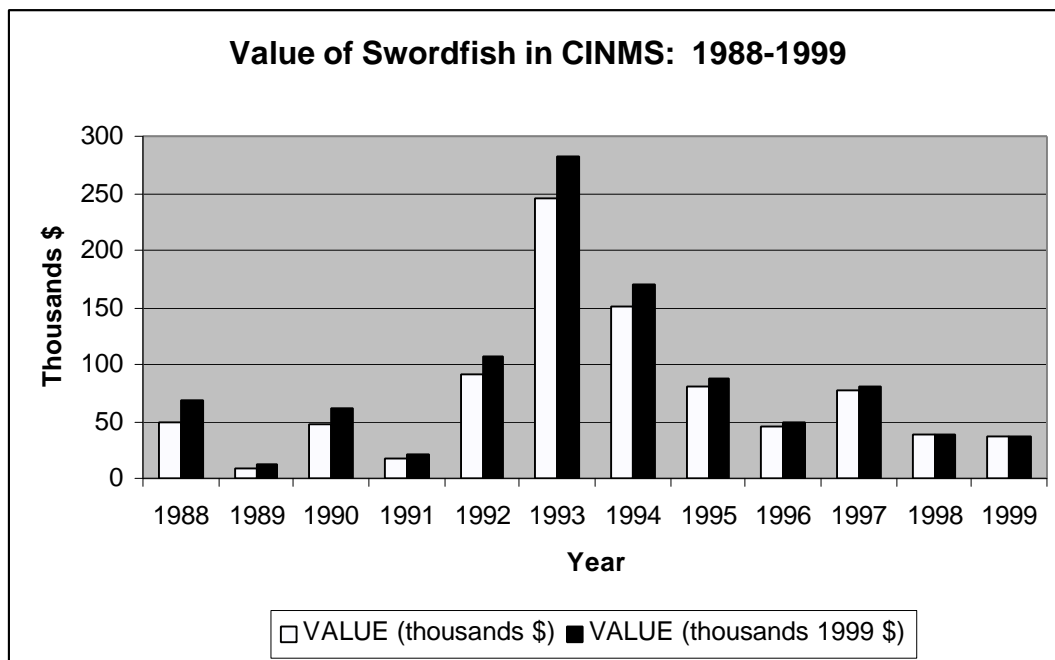
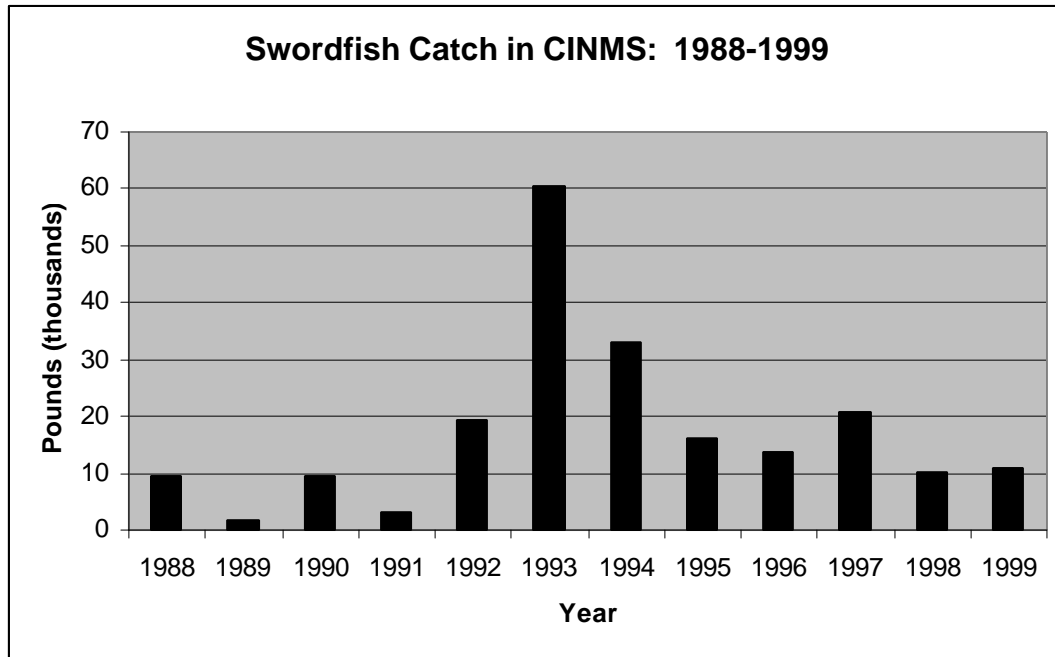
## APPENDIX C



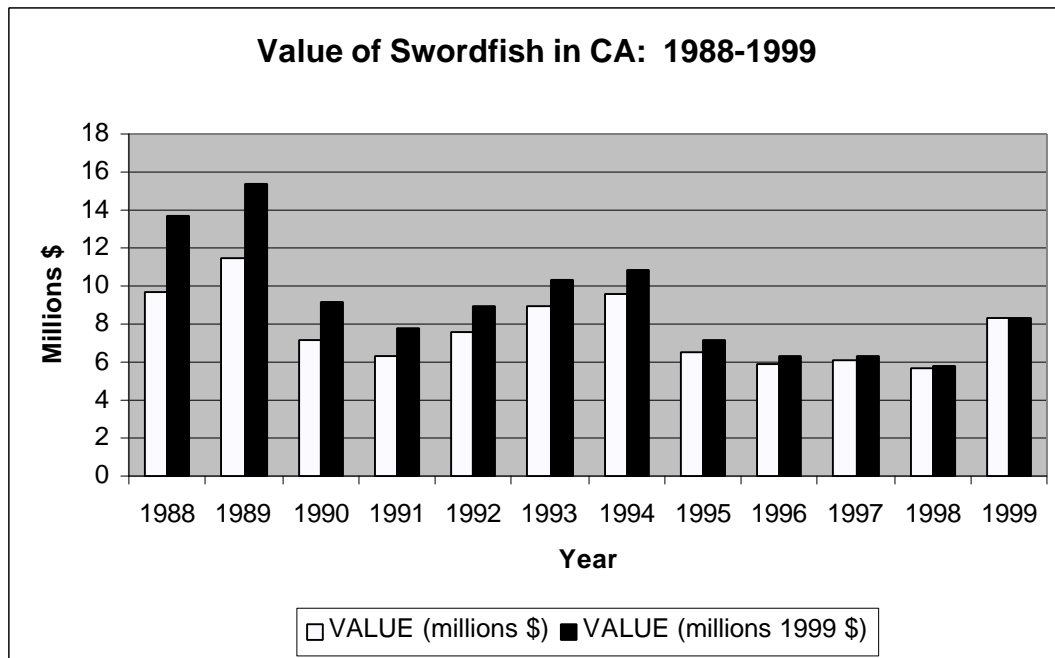
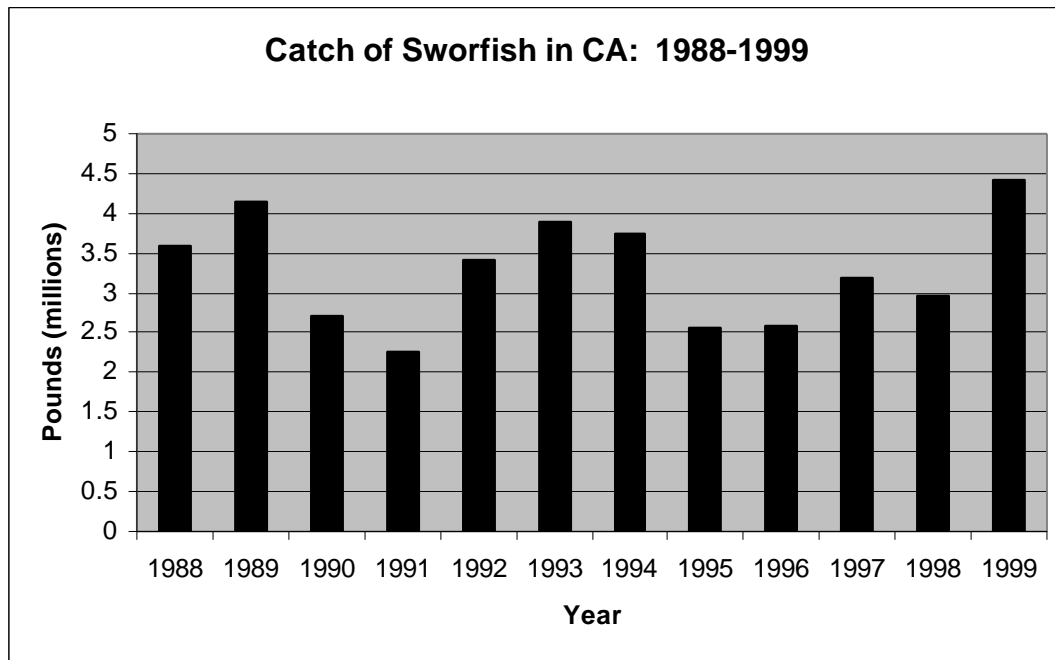
## APPENDIX C



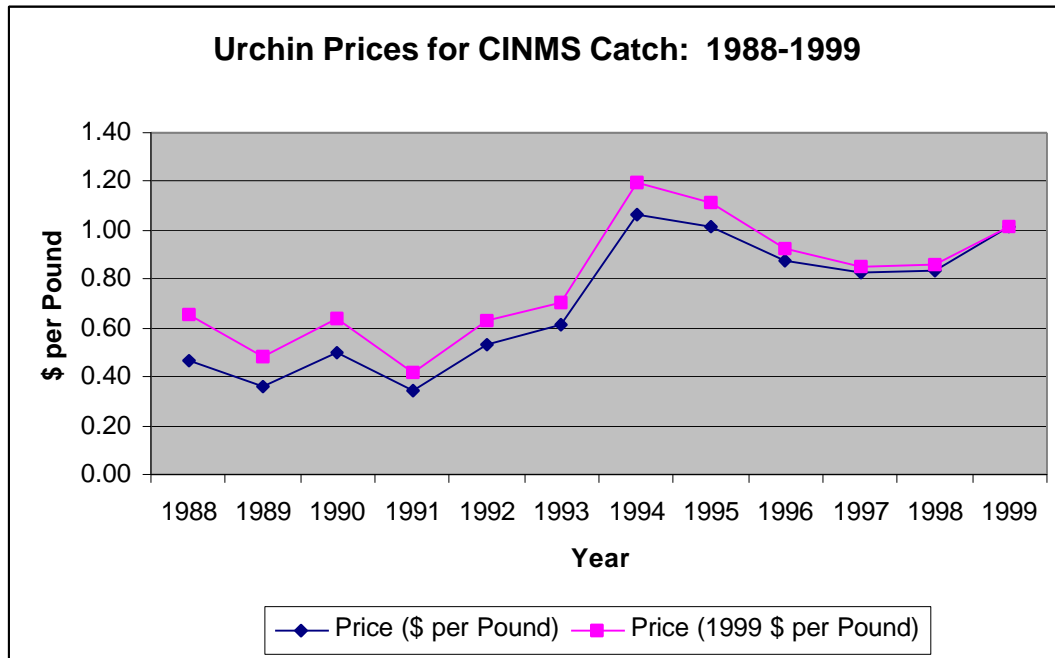
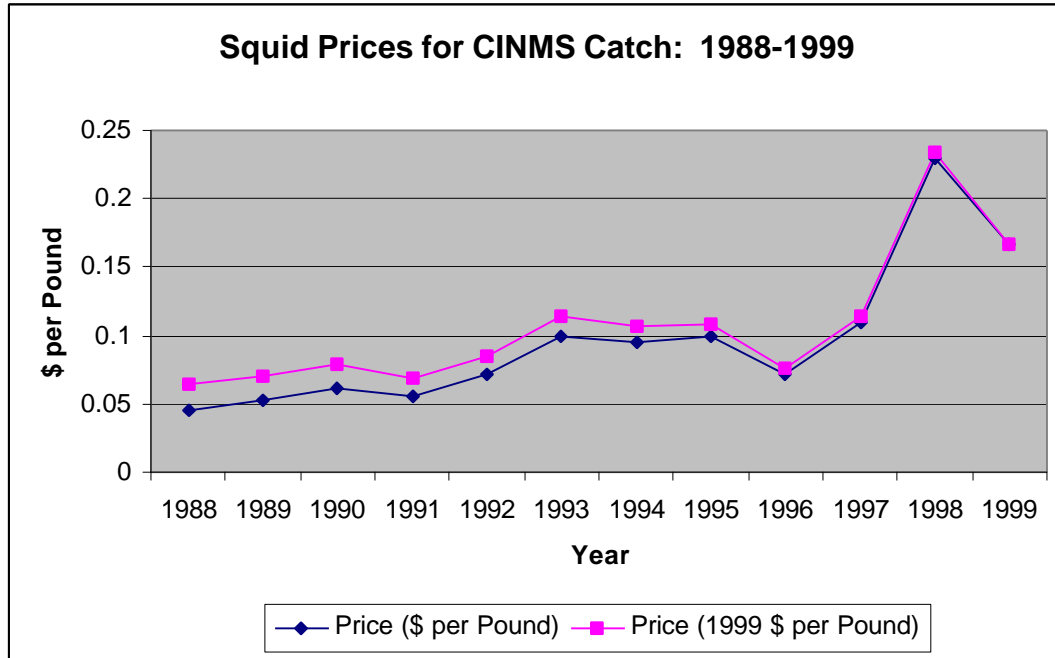
## APPENDIX C



## APPENDIX C

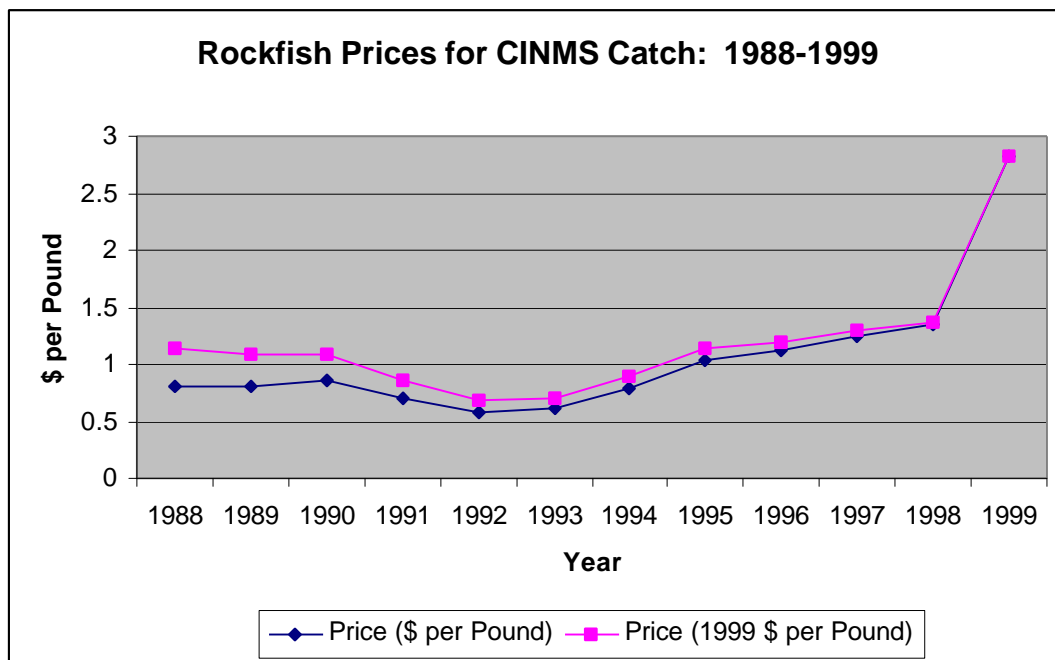
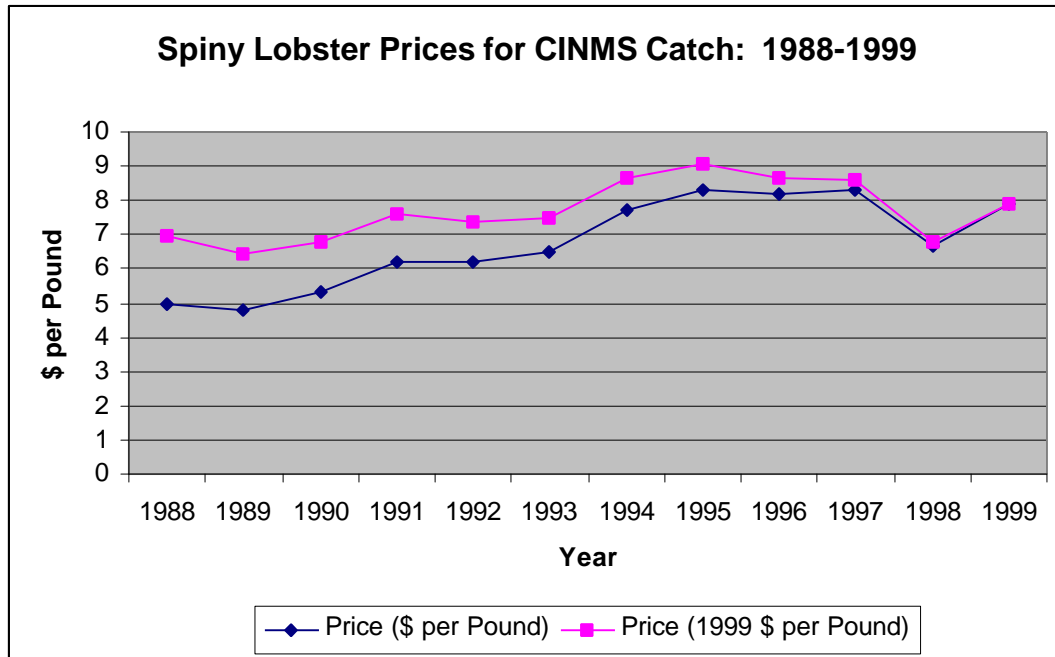


## APPENDIX C



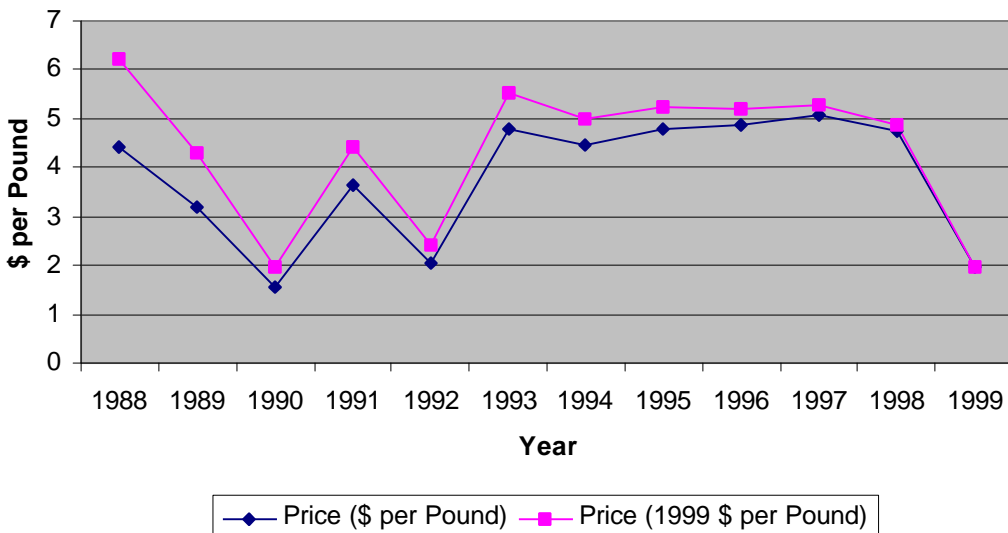


## APPENDIX C

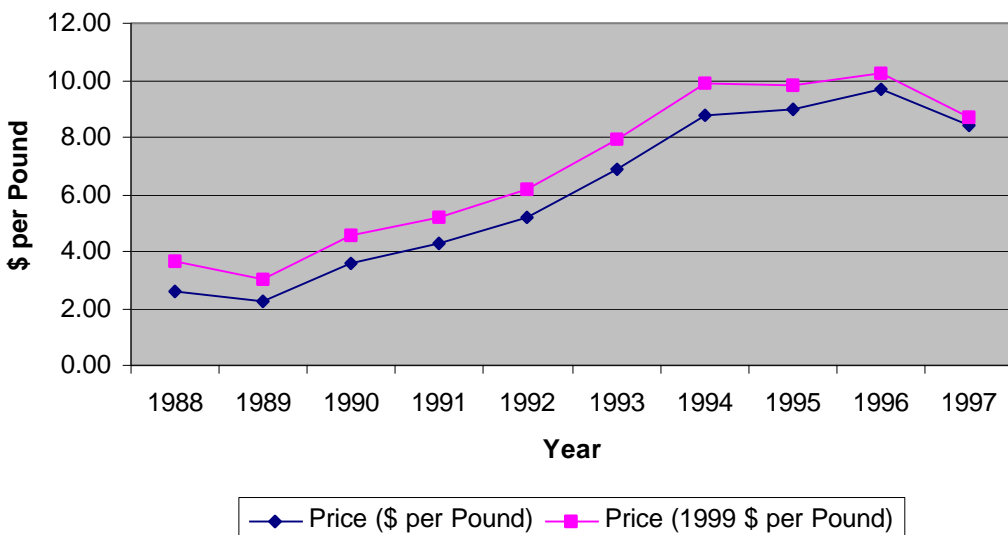


## APPENDIX C

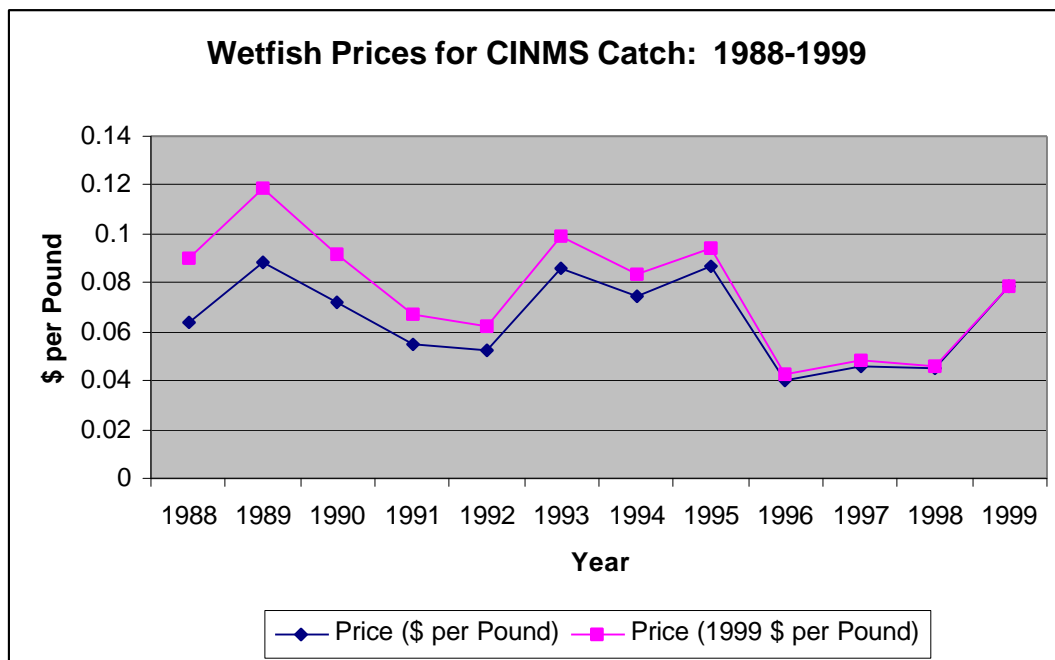
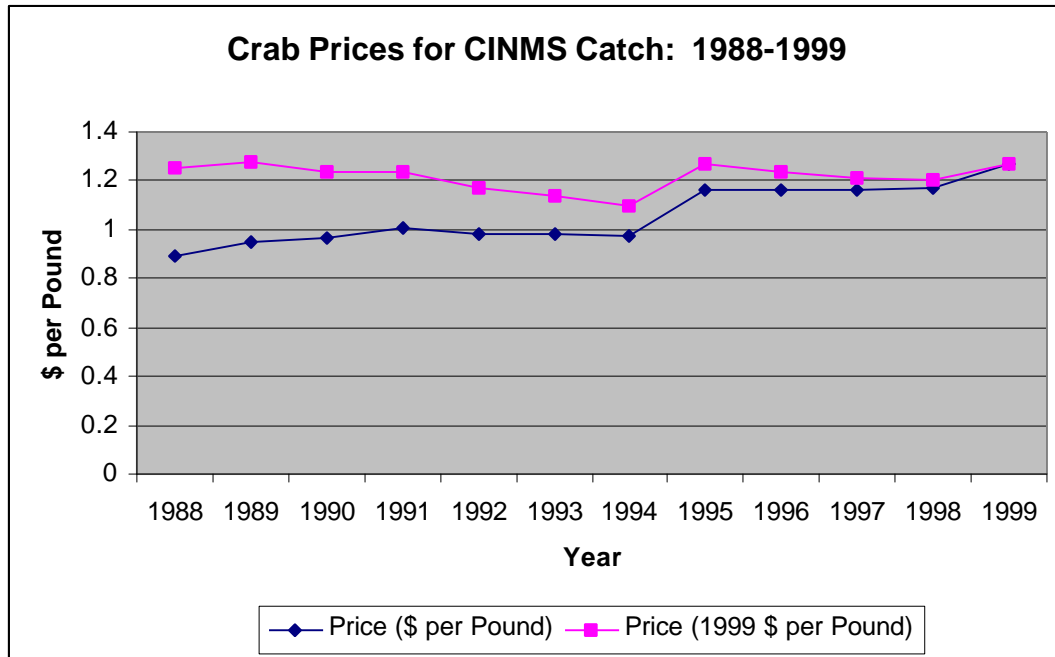
**Prawn Prices for CINMS Catch: 1988-1999**



**Abalone Prices for CINMS Catch: 1988-1999**

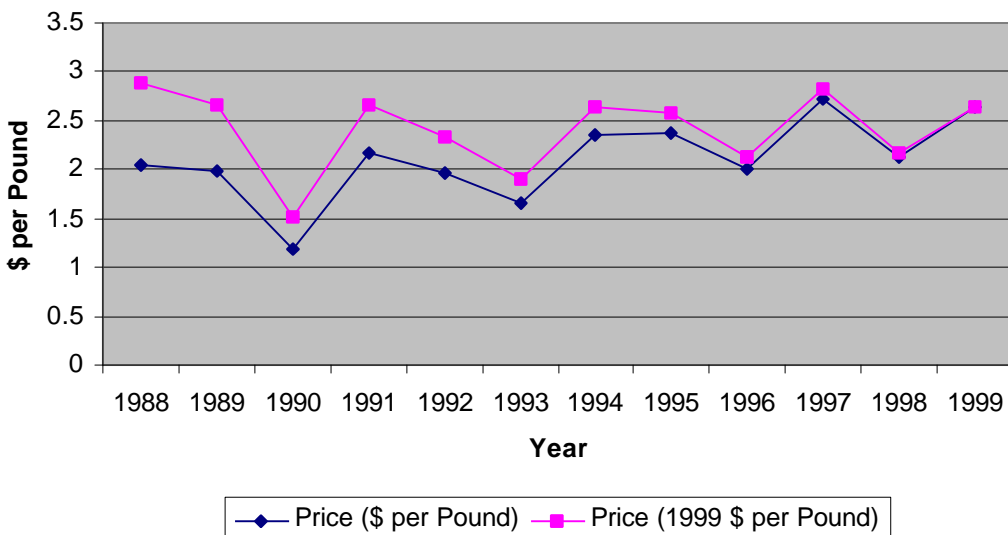


## APPENDIX C

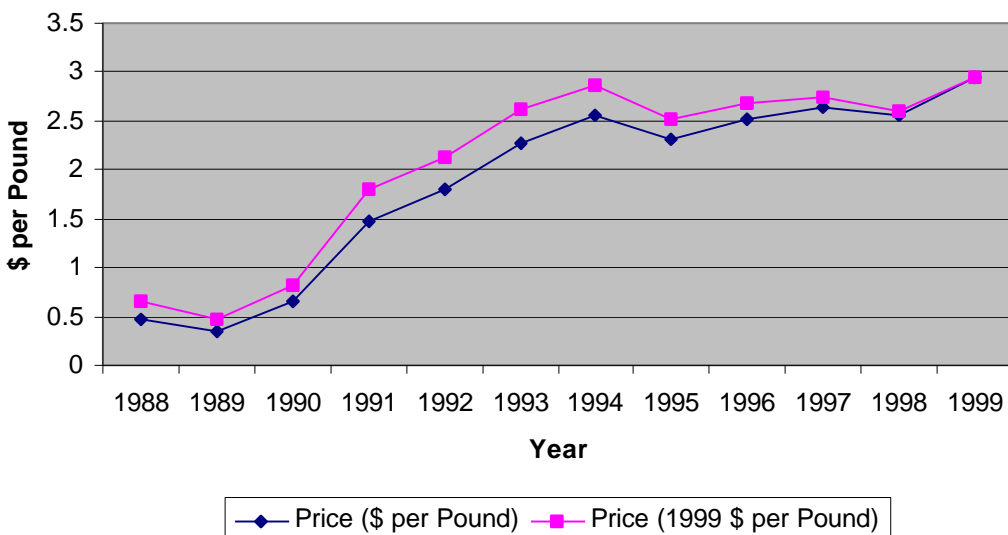


## APPENDIX C

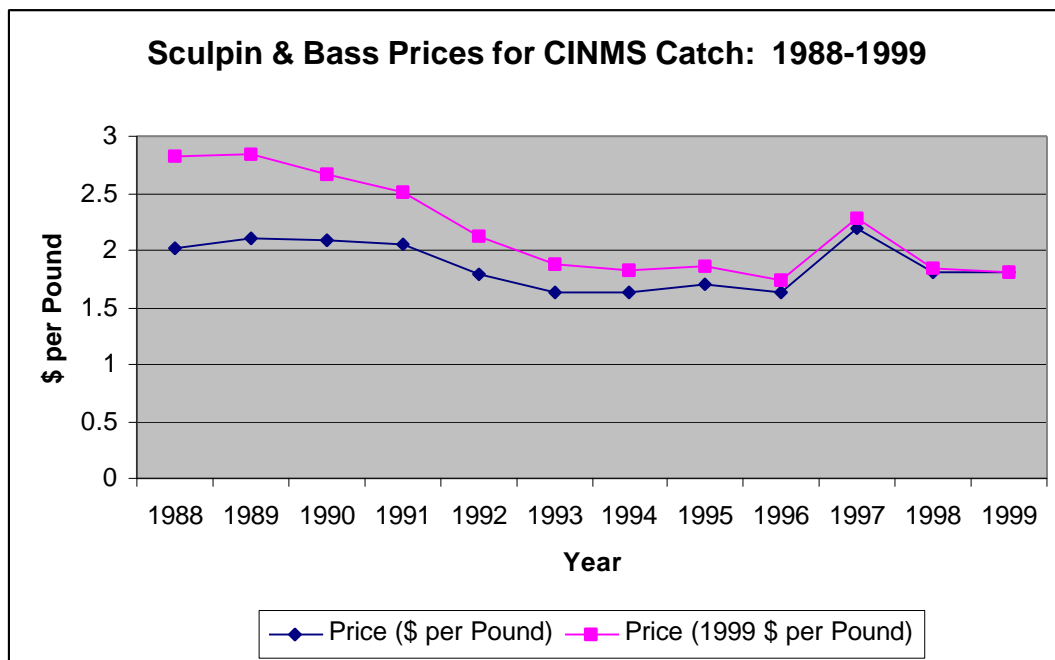
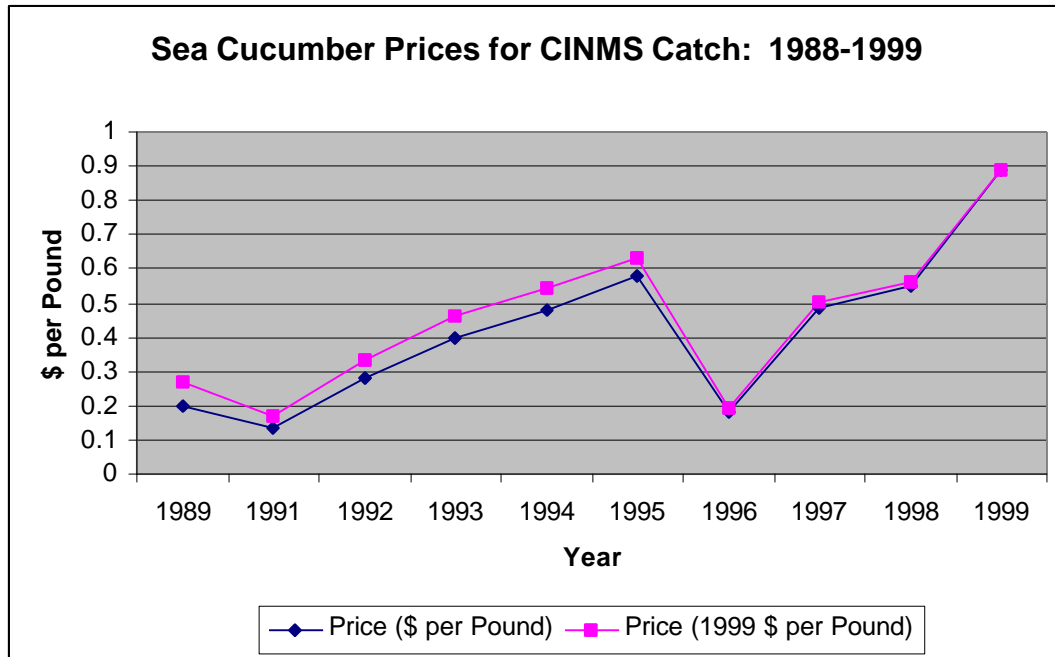
**Flatfish Prices for CINMS Catch: 1988-1999**



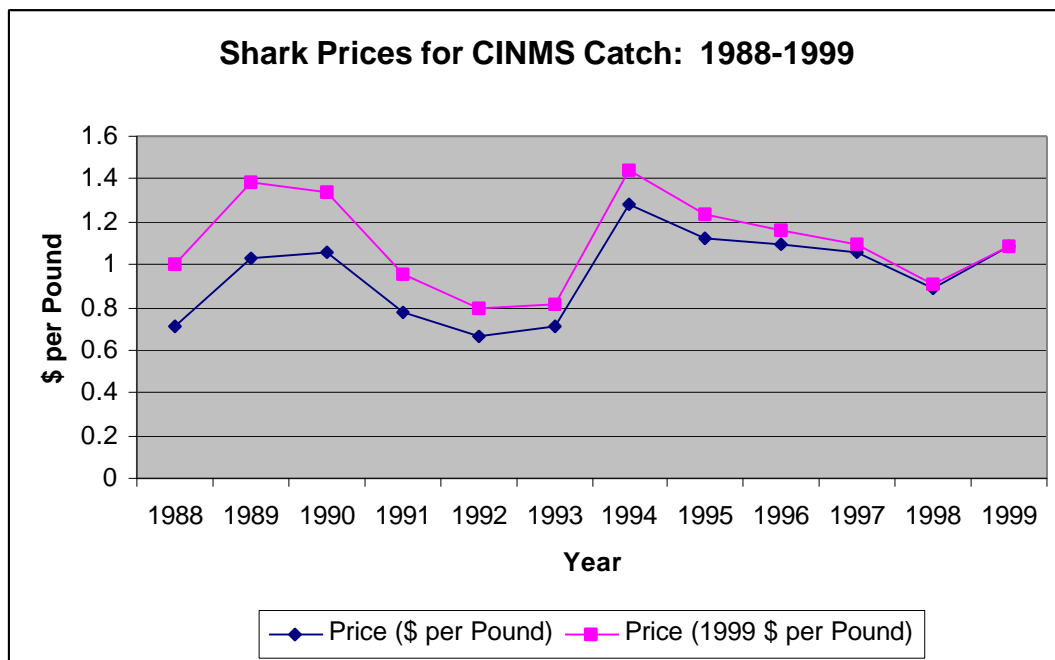
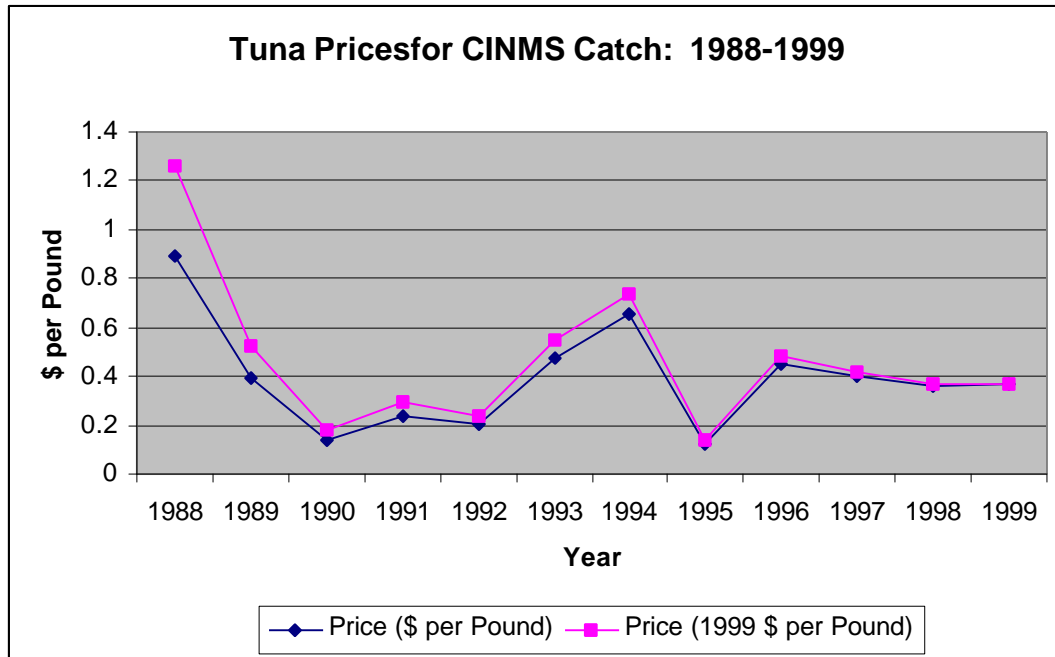
**CA Sheepshead Prices for CINMS Catch: 1988-1999**



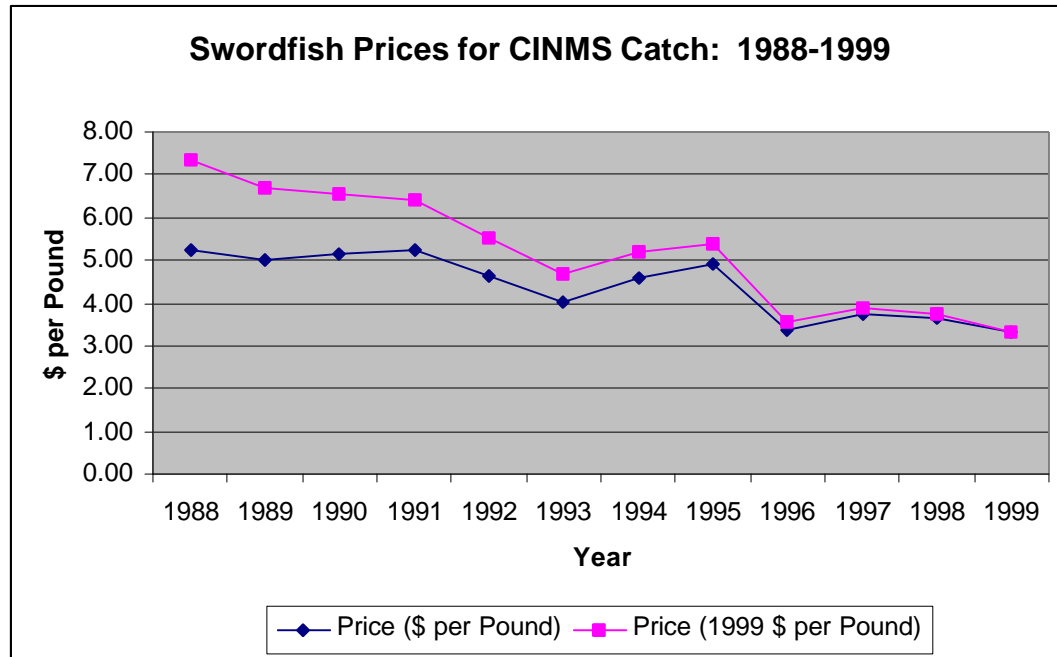
## APPENDIX C



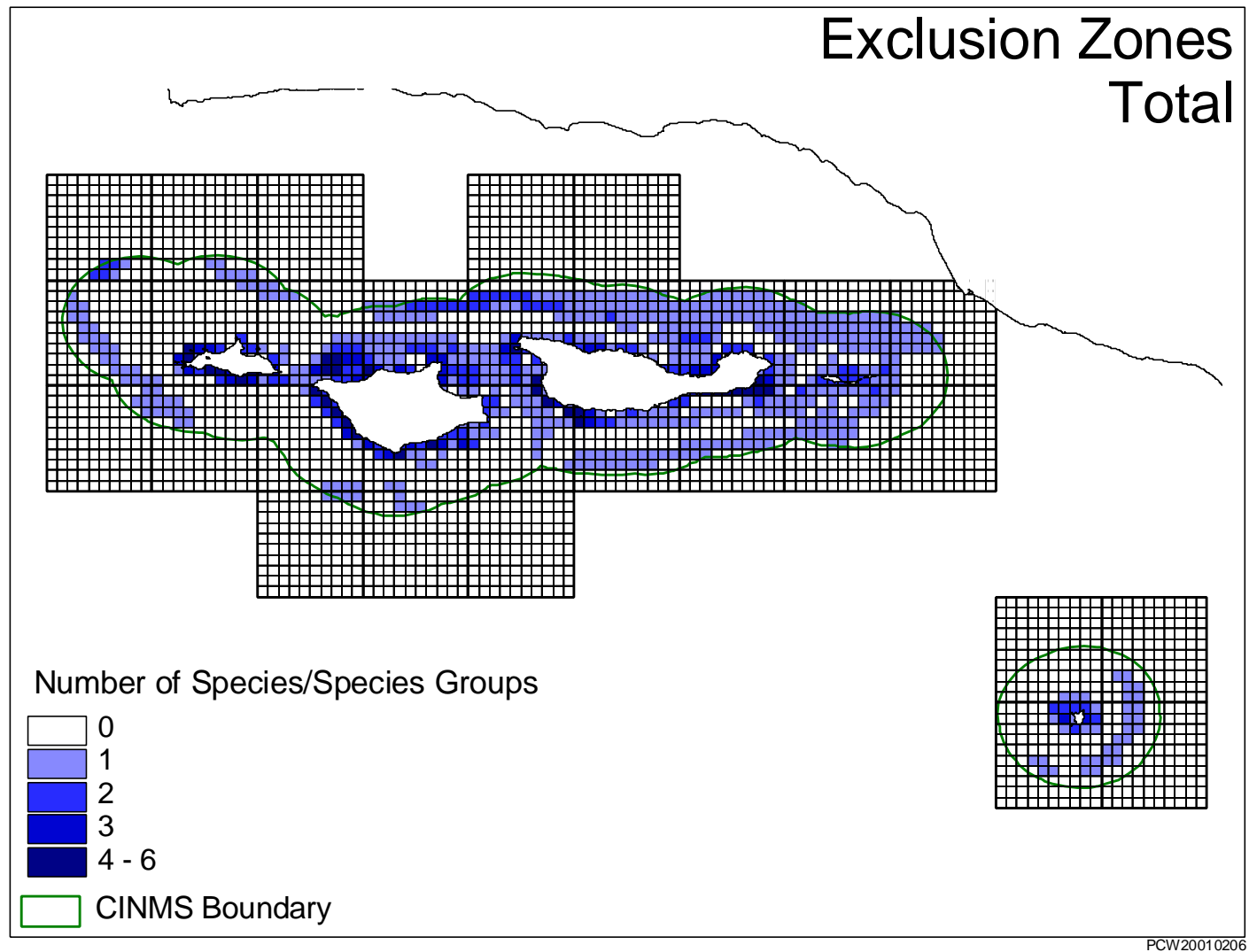
## APPENDIX C



## APPENDIX C

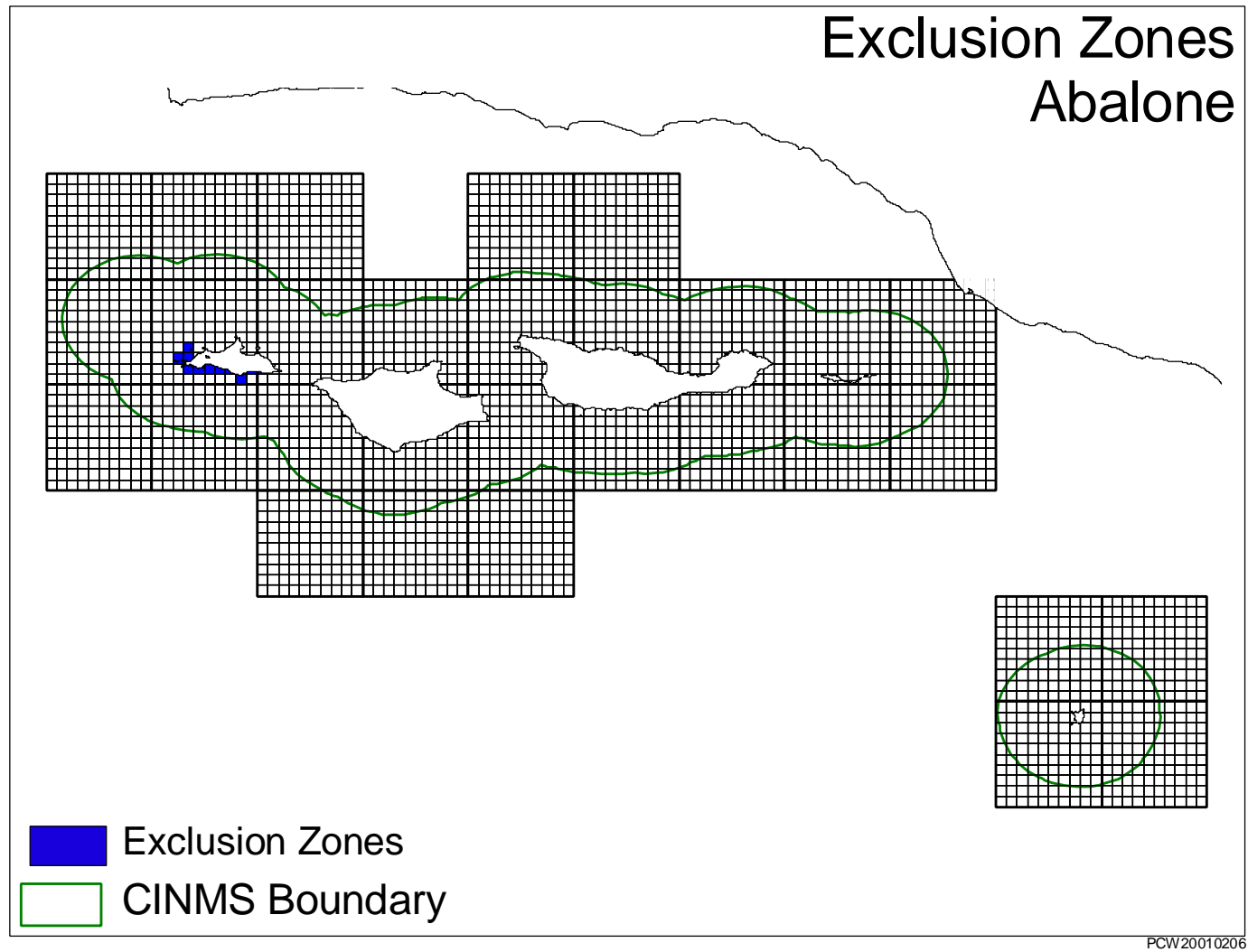


## APPENDIX C

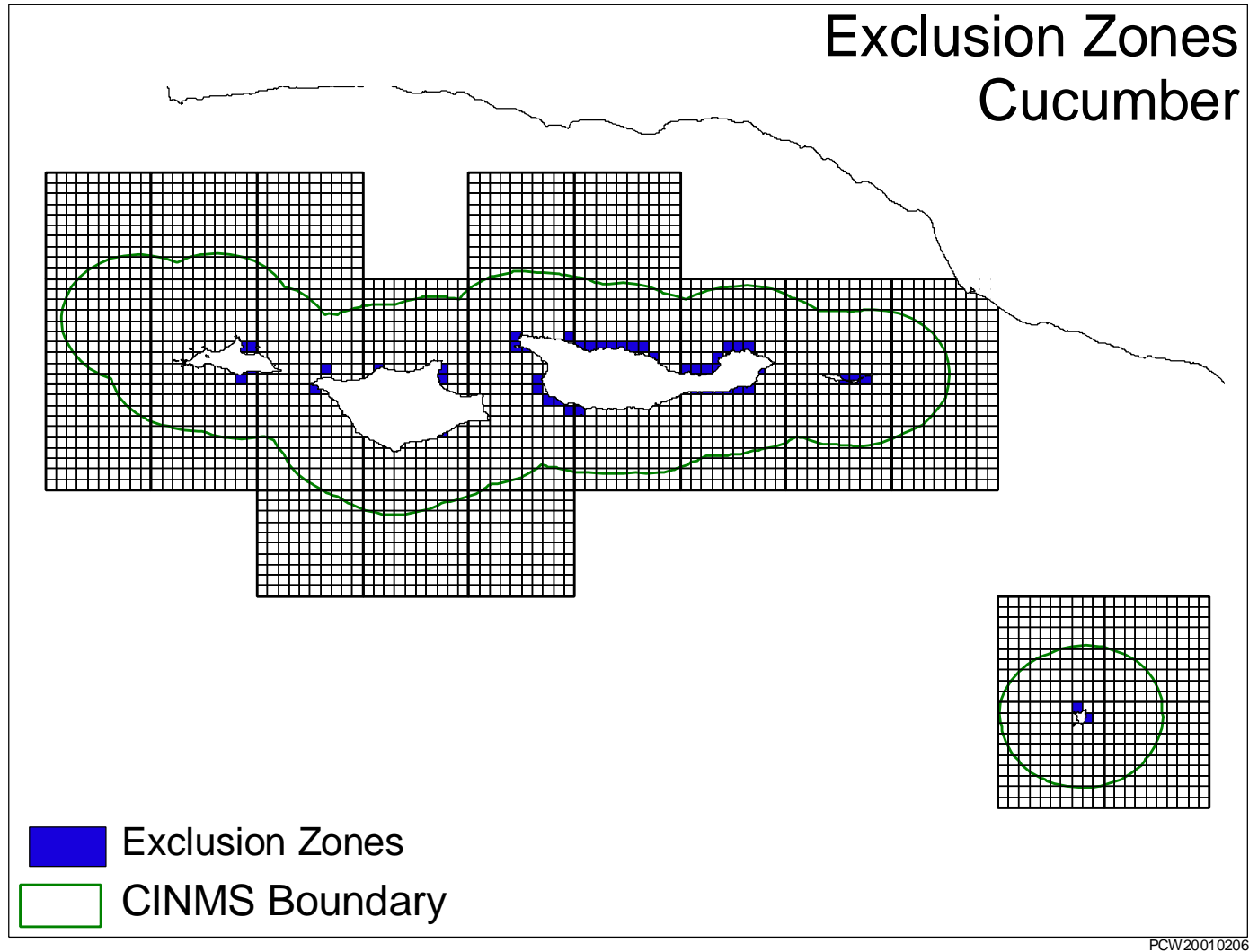




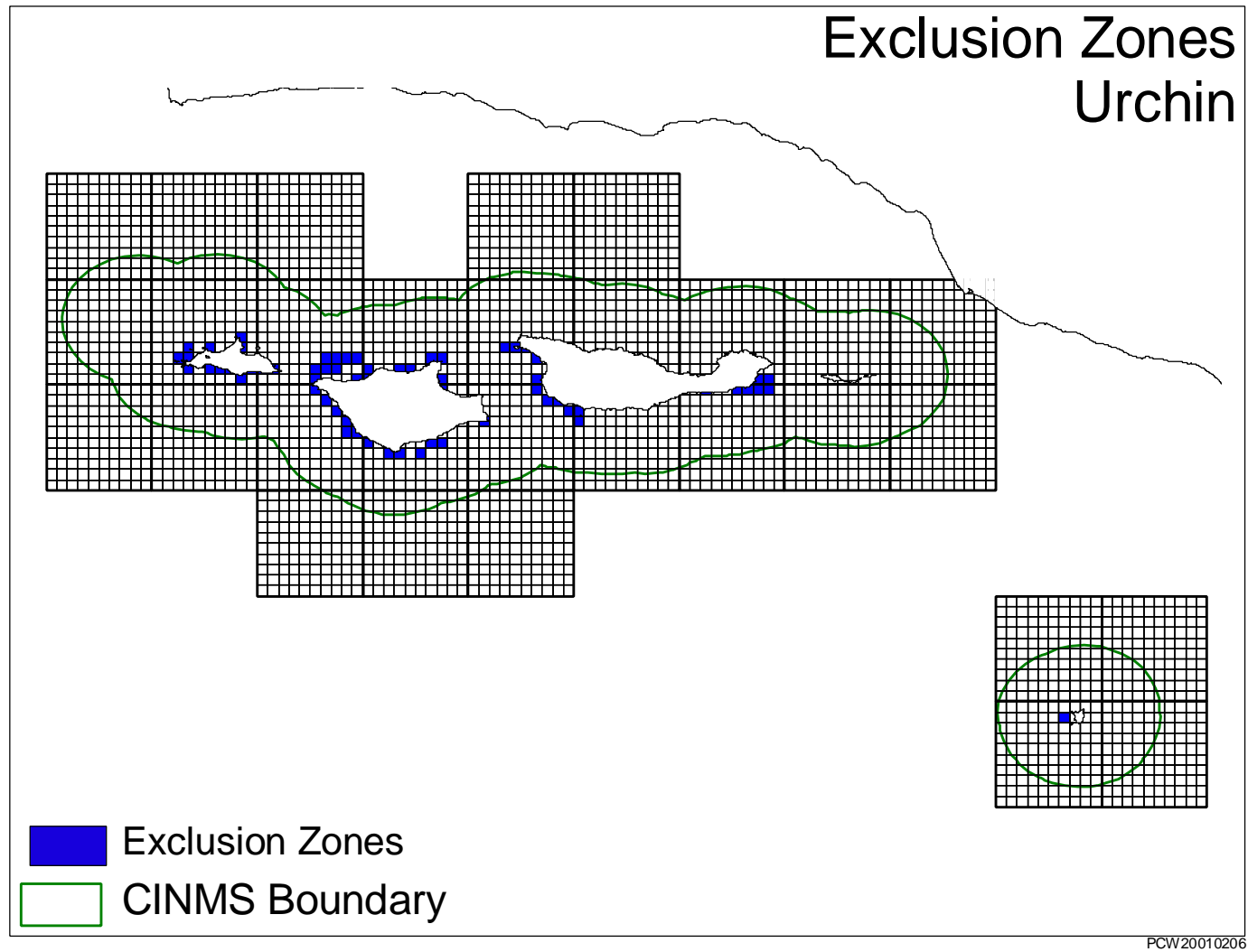
## APPENDIX C



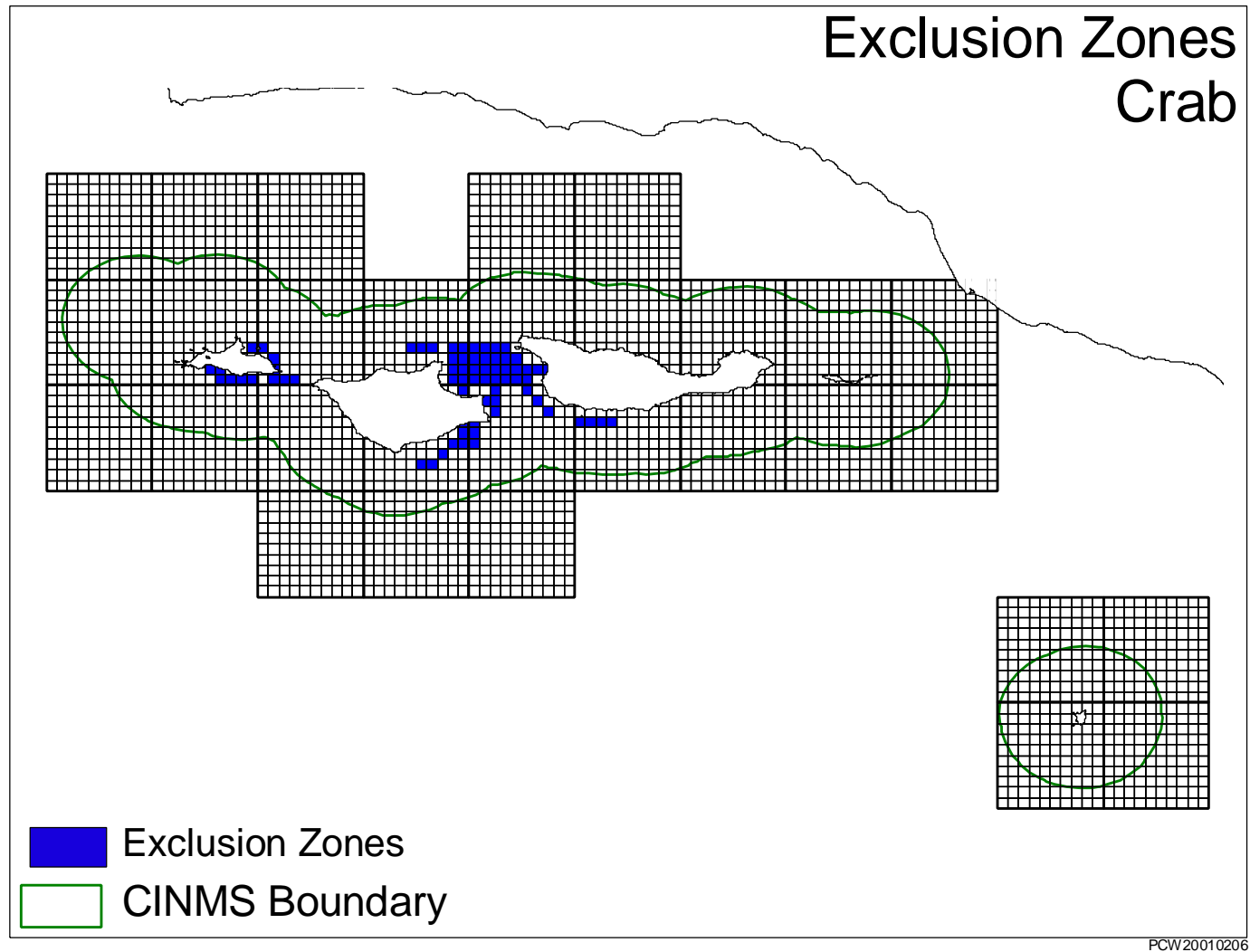
## APPENDIX C



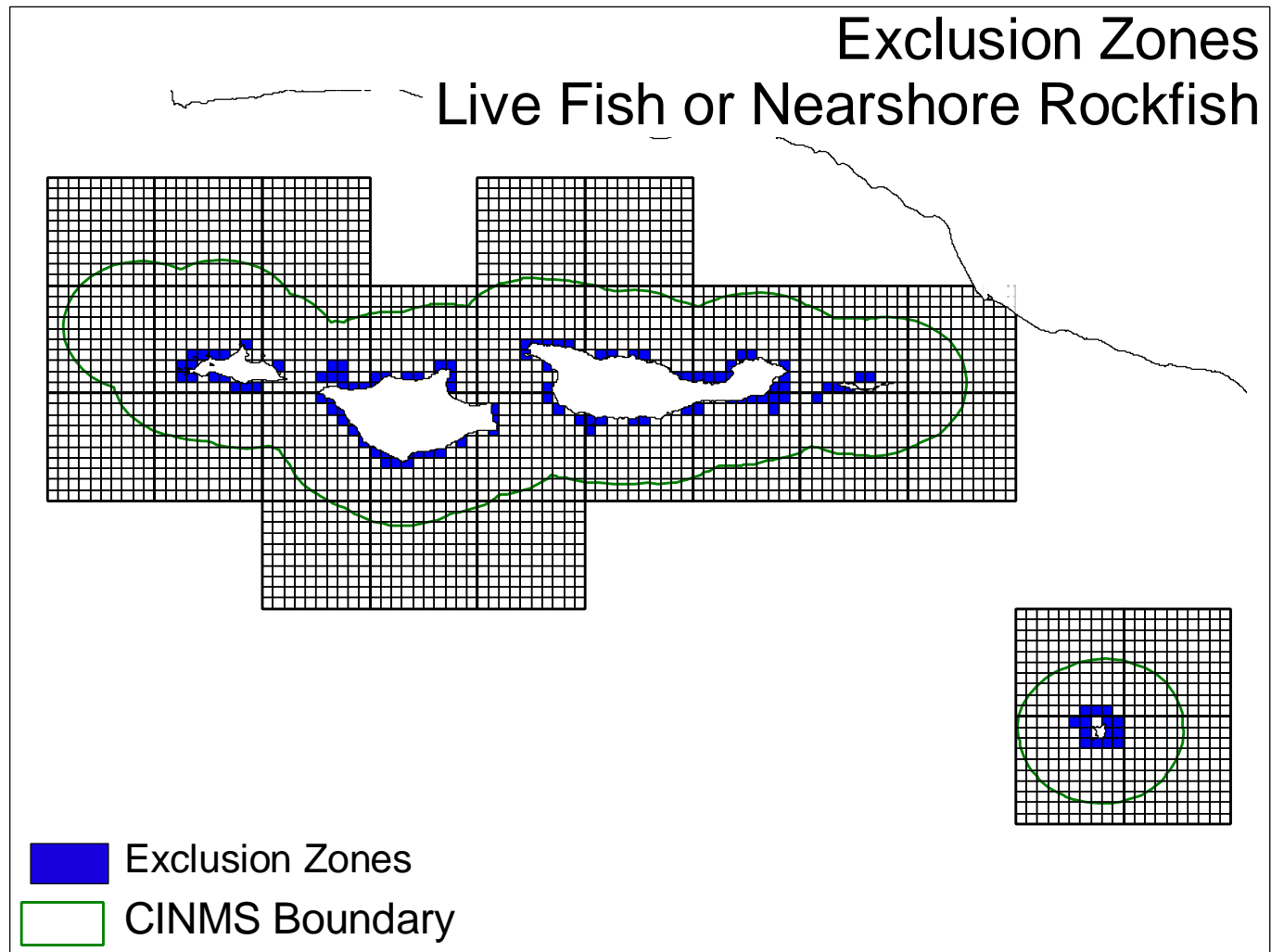
## APPENDIX C



## APPENDIX C

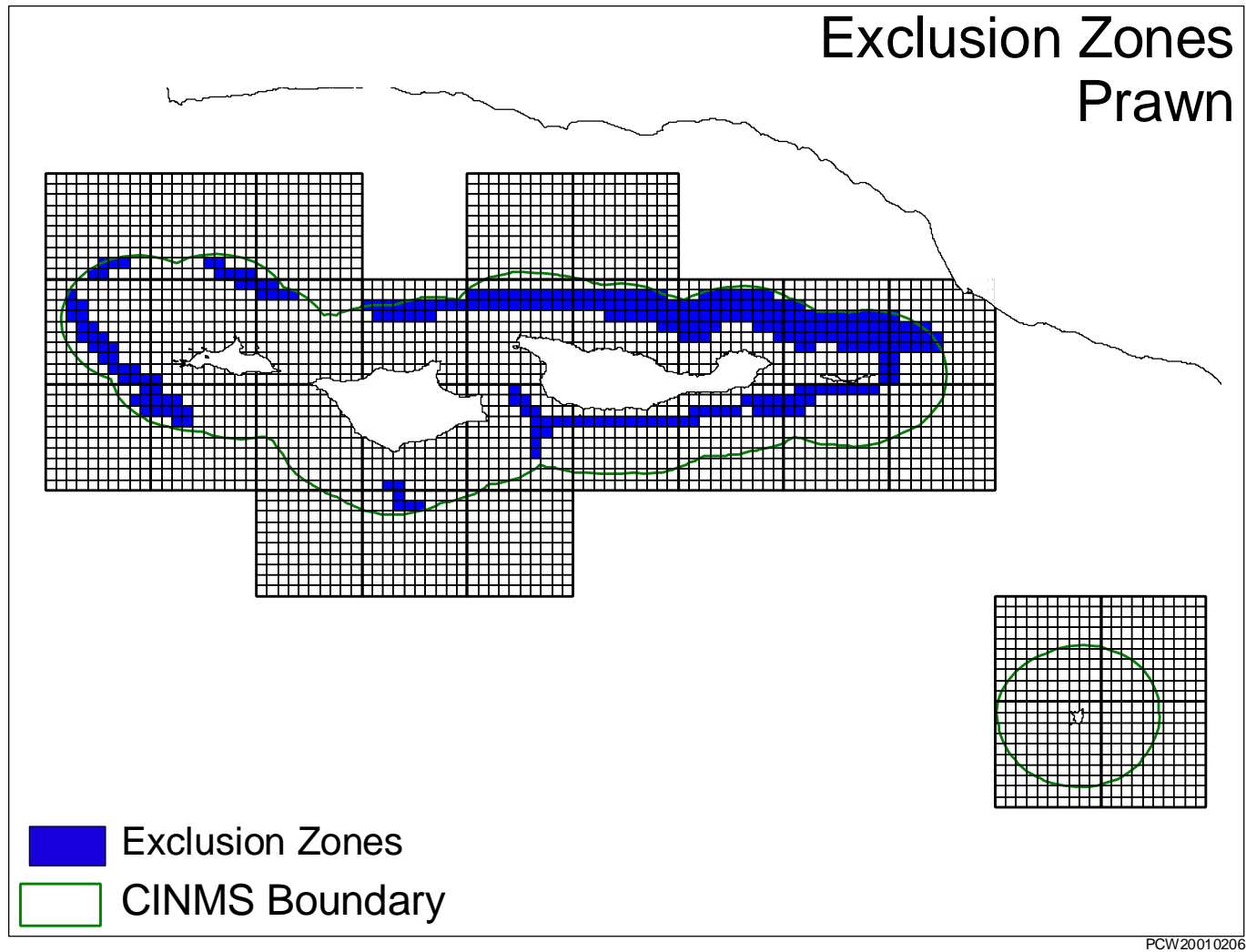


## APPENDIX C

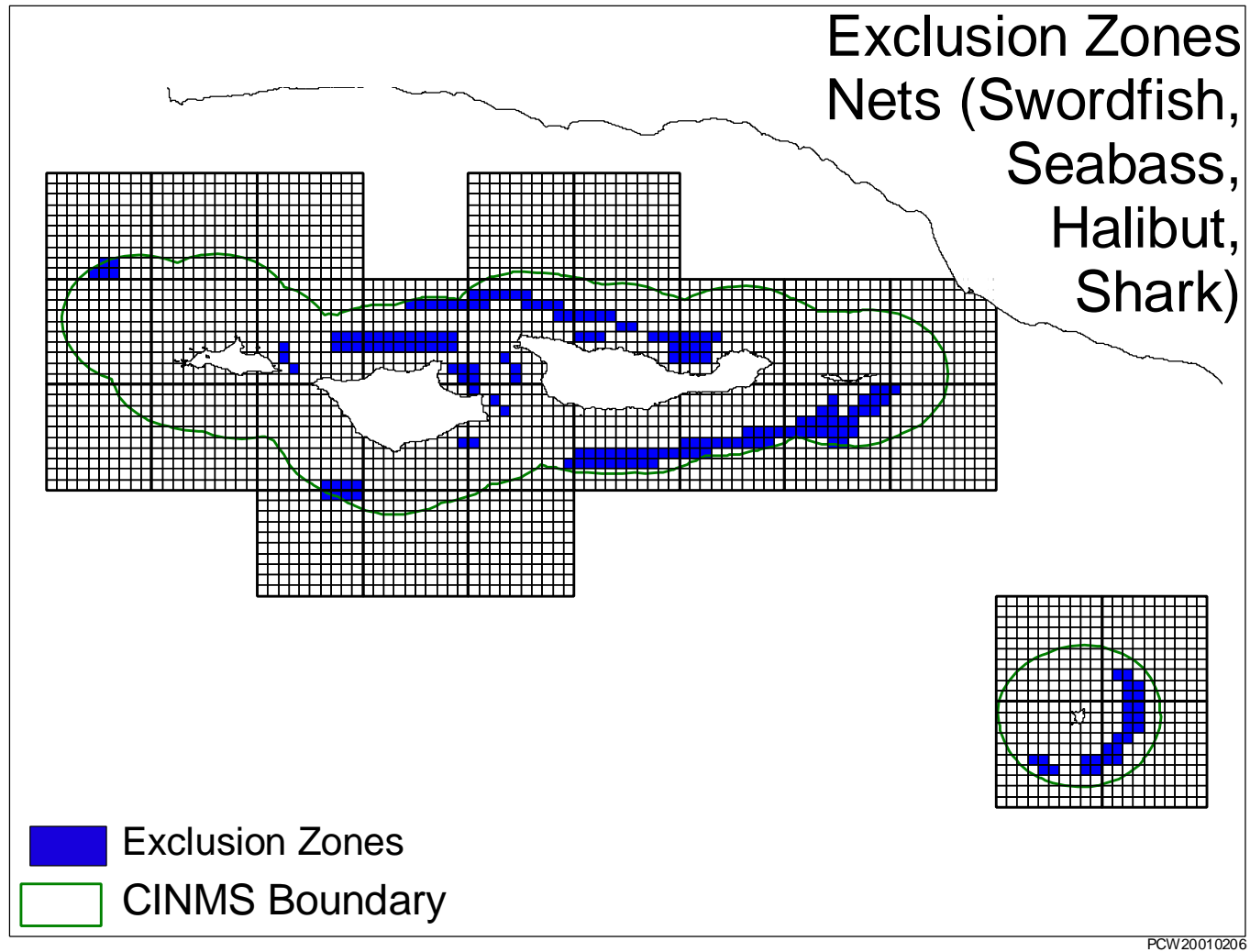


PCW20010206

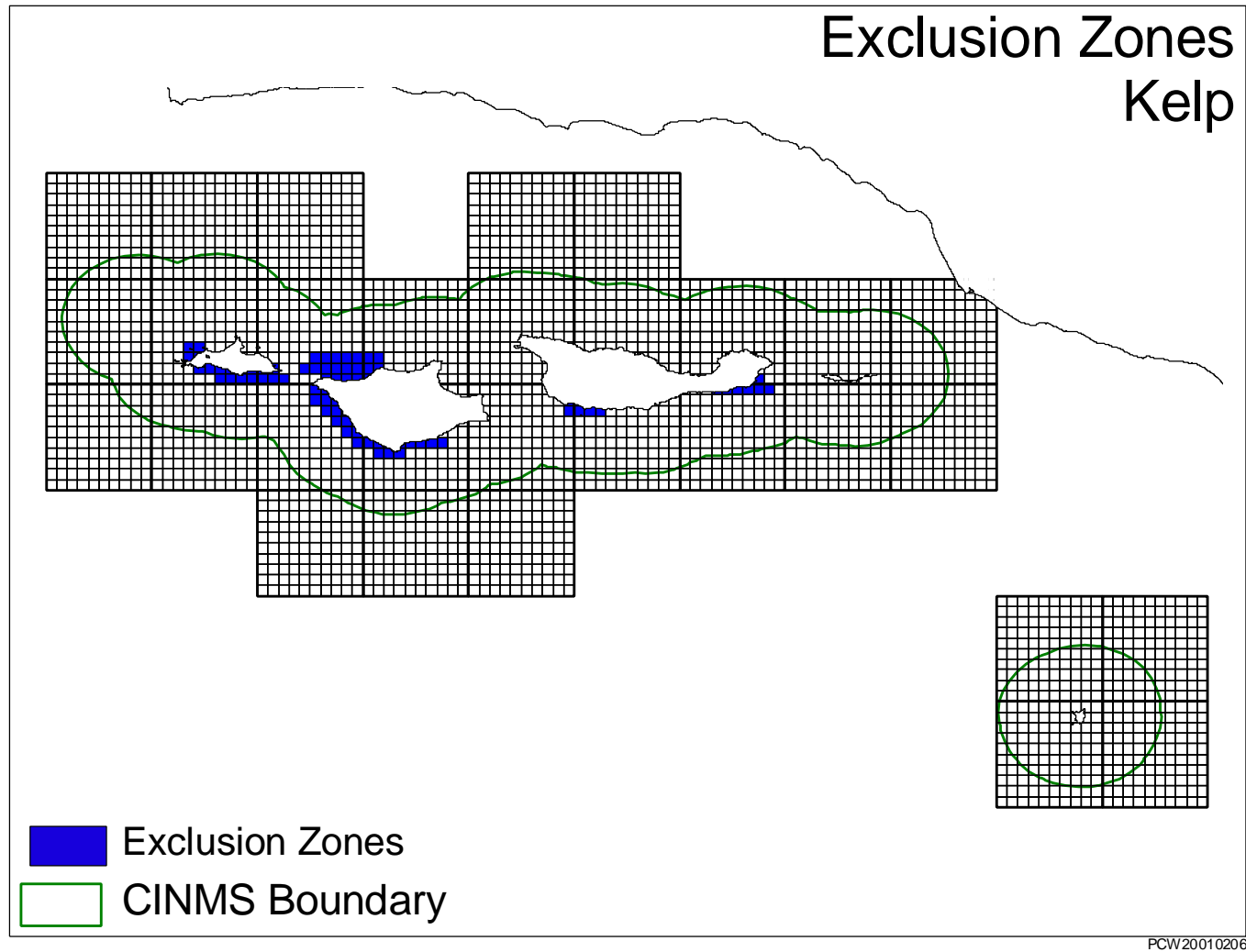
## APPENDIX C



## APPENDIX C

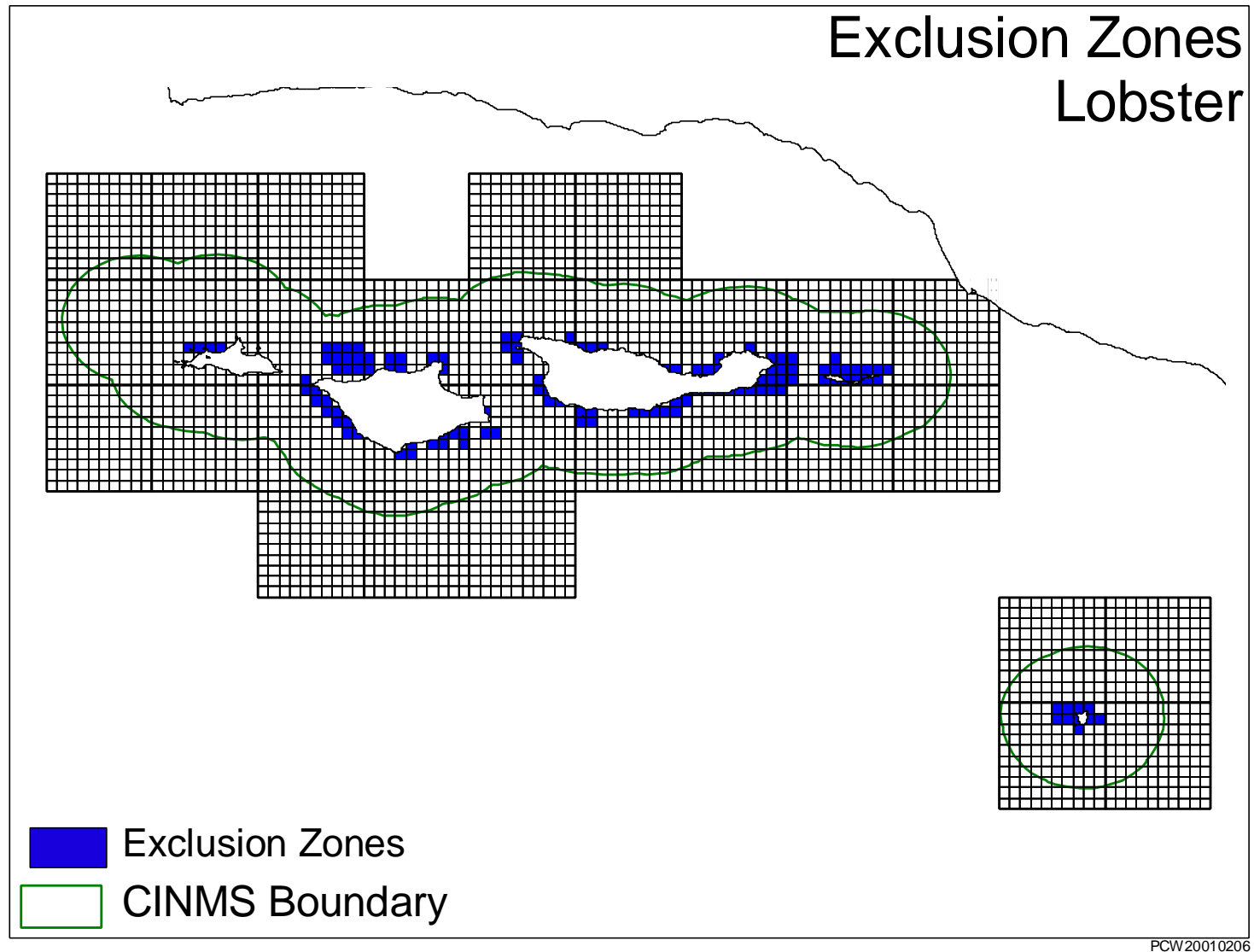


## APPENDIX C





## APPENDIX C



## APPENDIX C

### Recreation

#### CONSUMPTIVE ACTIVITIES

The impact model for consumptive activities is ready for analysis. All of the parameters have been estimated and the model constructed.

##### Charter/party boat fishing

This data was collected under contract by Dr. Charles Kolstad of UC Santa Barbara. The charter/party operations in this survey are a *census* of operators, therefore this data represents the population, not a sample. The unit of observation in the survey was a firm, many of which operate multiple boats (the data was not collected by boat). Data was collected in one by one minute square grid cells within the study area. For charter/party boat fishing, 18 operators were surveyed for a total of 158,768 person-days of activity in the study area.

##### Charter/party boat consumptive diving

This data was also collected under contract by Dr. Kolstad. The charter/party operations in this survey are a *census* of operators, therefore this data is the population, not a sample. The unit of observation in the survey was a firm, many of which operate multiple boats (the data was not collected by boat). Data was collected in one by one minute square grid cells within the study area. For charter/party boat consumptive diving, 10 operators were surveyed for a total of 17,935 person-days of activity in the study area.

##### Private boat fishing

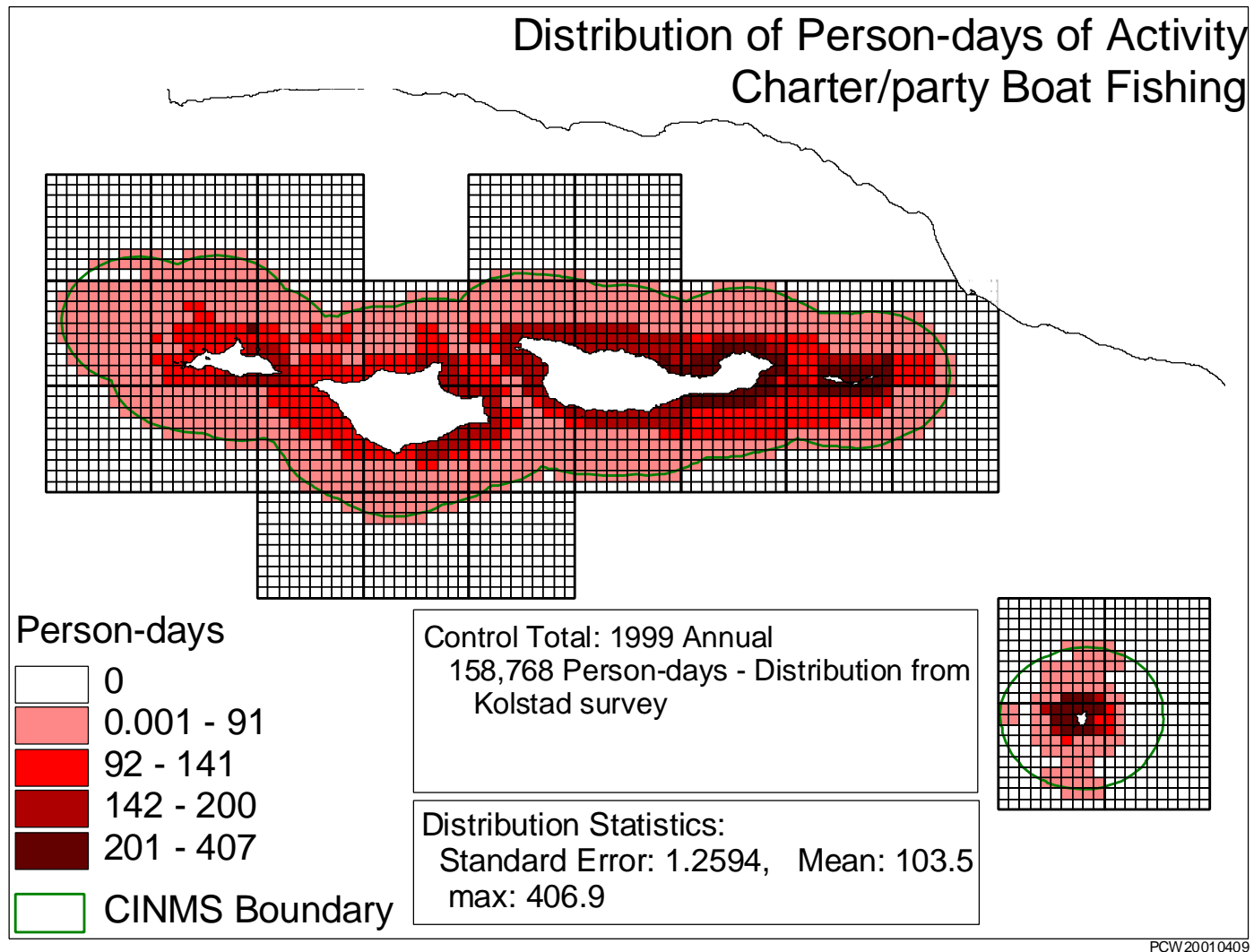
The distribution of private boat activities was pieced together using multiple sources of information/data with varying degrees of specificity and geographic coverage. In general, data was placed in the grid cells for which it was available, then using the assumption that the relative distribution was the same for private boat fishing and charter/party boat fishing, values for grid-cell containing no data were estimated based on the relationship between charter/party boat fishing grid-cell values. Data sources included the Channel Islands National Park, The Nature Conservancy, Yacht Clubs (two out of seven contacted), and a Marina. Based on the above methodology, it is estimated that there are 214,015 person-days of private boat fishing annually in the study area.

##### Private boat diving

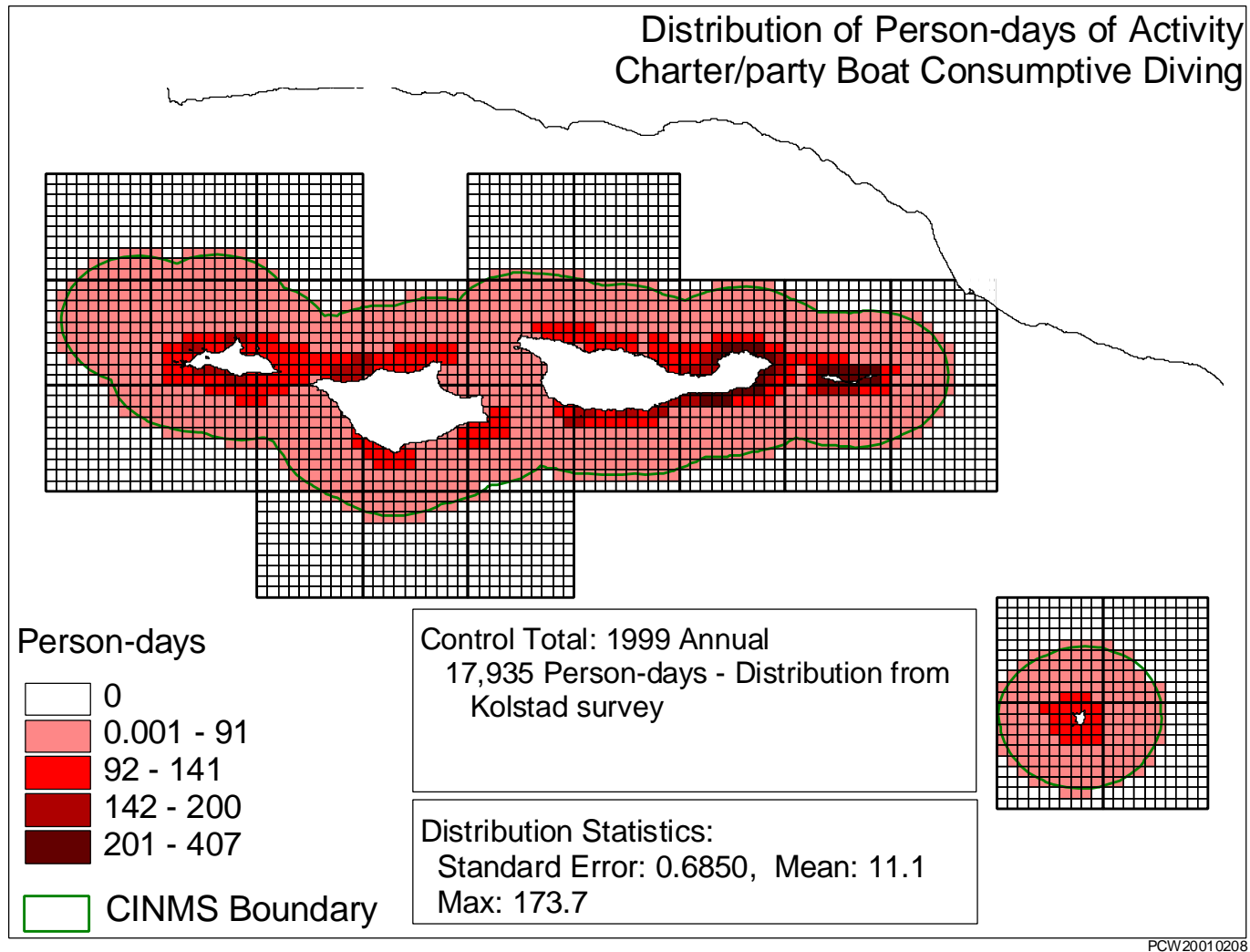
The distribution of private boat diving was derived in the same way as was private boat fishing. In general, data was placed in the grid cells for which it was available, then using the assumption that the relative distribution was the same for private boat fishing and charter/party boat fishing, values for grid-cell containing no data were estimated based on the relationship between charter/party boat fishing grid-cell values. Data sources included the Channel Islands National Park, The Nature Conservancy, Yacht Clubs, and a Marina. Based on the above methodology, it is estimated that there are 47,190 person-days of private boat fishing annually in the study area.



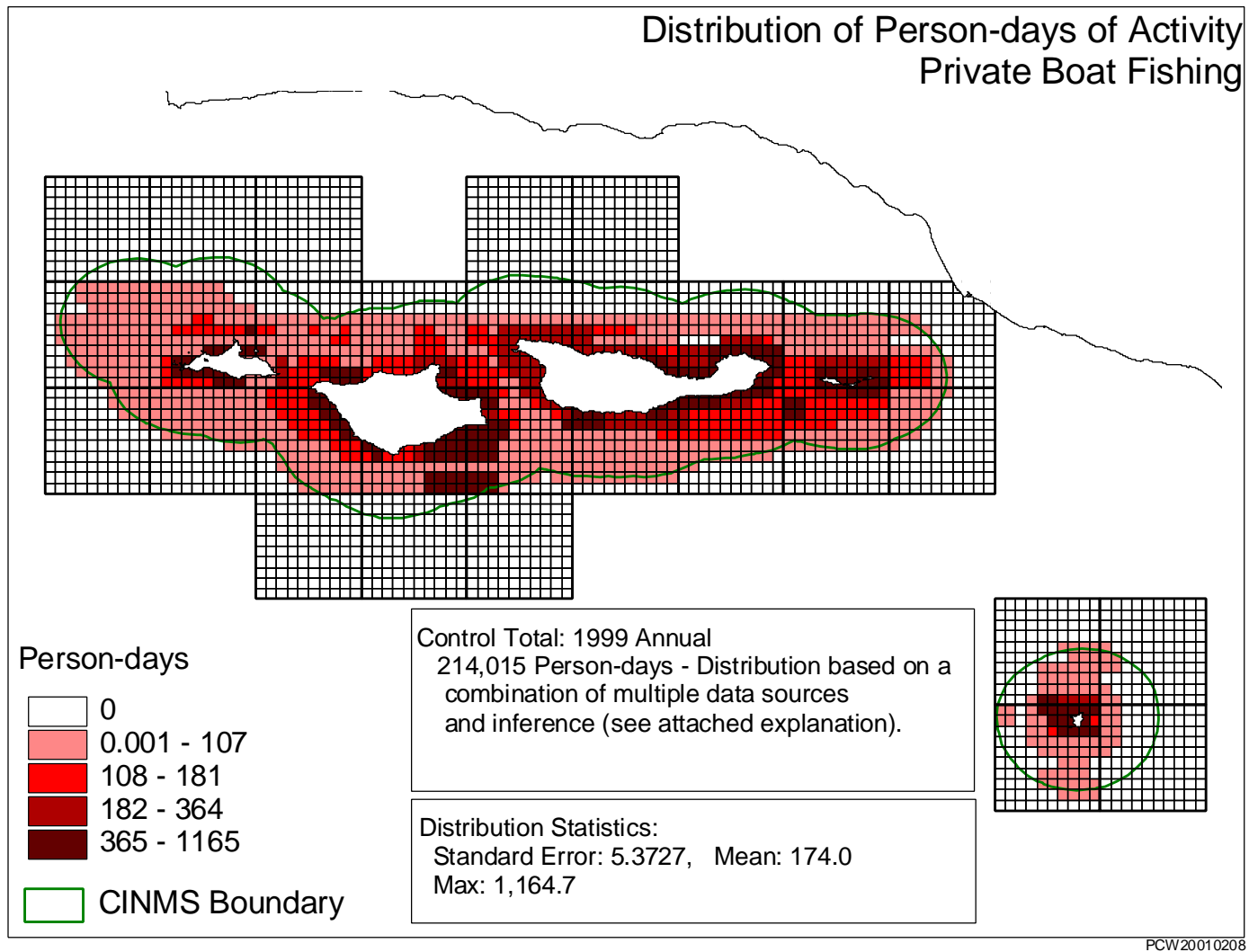
## APPENDIX C



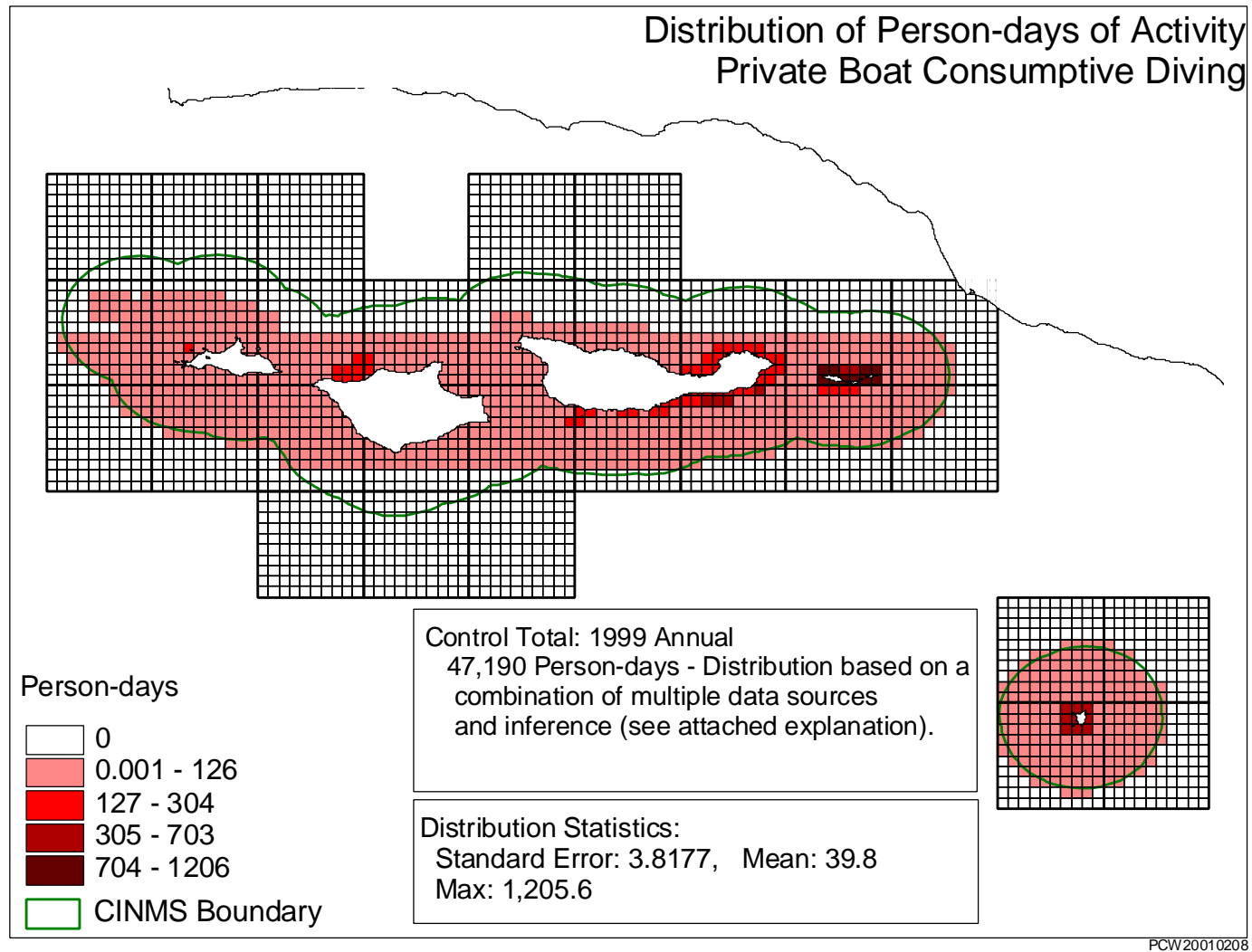
## APPENDIX C



## APPENDIX C



## APPENDIX C



## APPENDIX C

### Recreation

#### NON-CONSUMPTIVE ACTIVITIES

The impact model for non-consumptive activities is under final review. Parameters will be finalized in the near future. Per-person-per-day consumer's surplus and the sources for the expenditure profile for non-consumptive activities are being examined and if necessary, revised.

##### Whale watching

This data was collected under contract by Dr. Charles Kolstad of UC Santa Barbara. The charter/party operations in this survey are a *census* of operators, therefore this data represents the population, not a sample. The unit of observation in the survey was a firm, many of which operate multiple boats (the data was not collected by boat). Data was collected in one by one minute square grid cells within the study area. For charter/party boat fishing, 8 operators were surveyed for a total of 25,984 person-days of activity in the study area. We were unable to locate any sources for private boat whale watching.

##### Non-consumptive diving

This data was also collected under contract by Dr. Kolstad. The charter/party operations in this survey are a *census* of operators, therefore this data is the population, not a sample. The unit of observation in the survey was a firm, many of which operate multiple boats (the data was not collected by boat). Data was collected in one by one minute square grid cells within the study area. For charter/party boat non-consumptive diving, 7 operators were surveyed for a total of 10,776 person-days of activity in the study area. In some cases operators engaged in both consumptive and non-consumptive diving. In these cases the person-days of each was provided separately.

##### Sailing

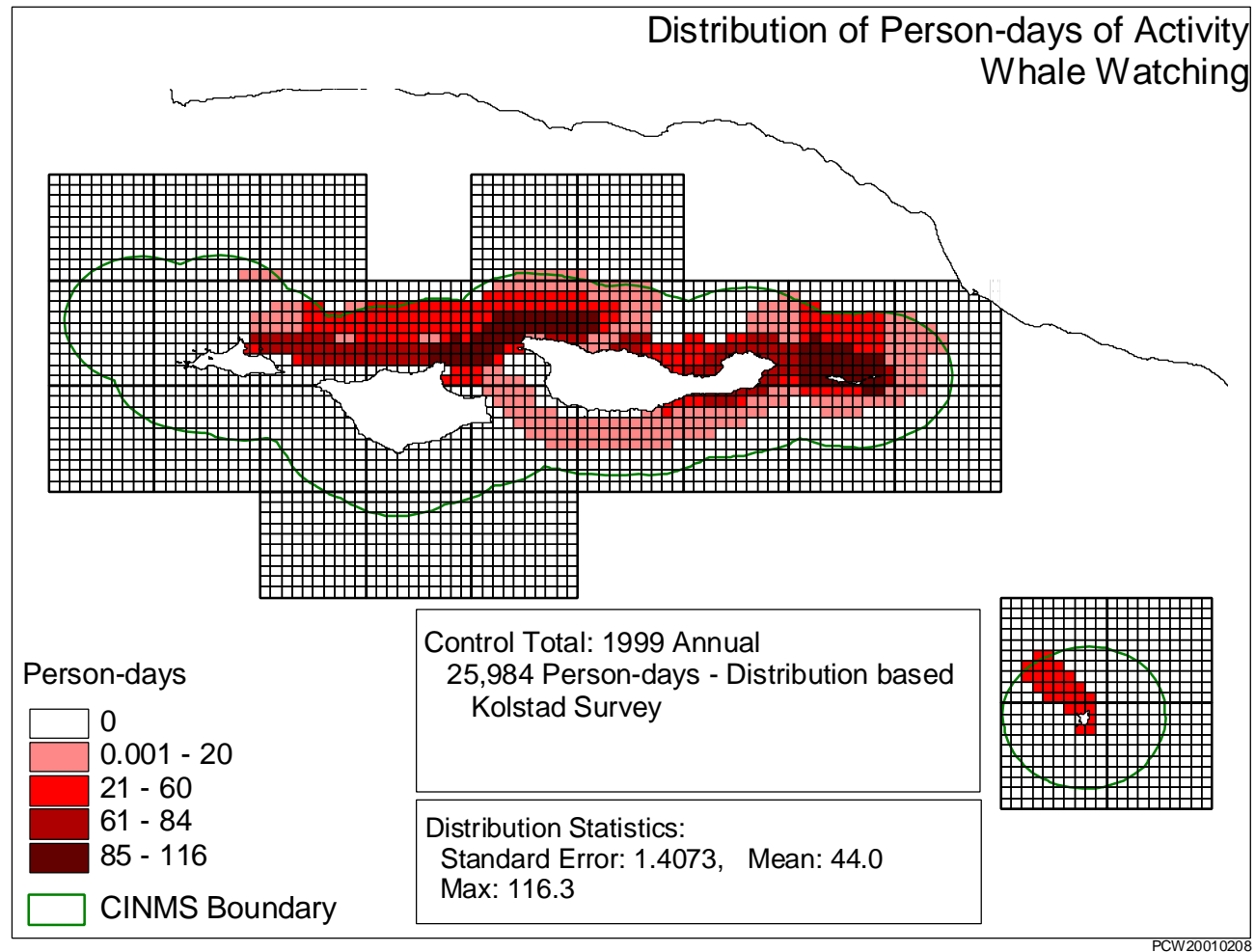
This data was also collected as part of Dr. Kolstad's survey. 8 charter sailing operators were surveyed for a total of 4,015 person-days of activity in the study area.

##### Kayaking/Island Sightseeing

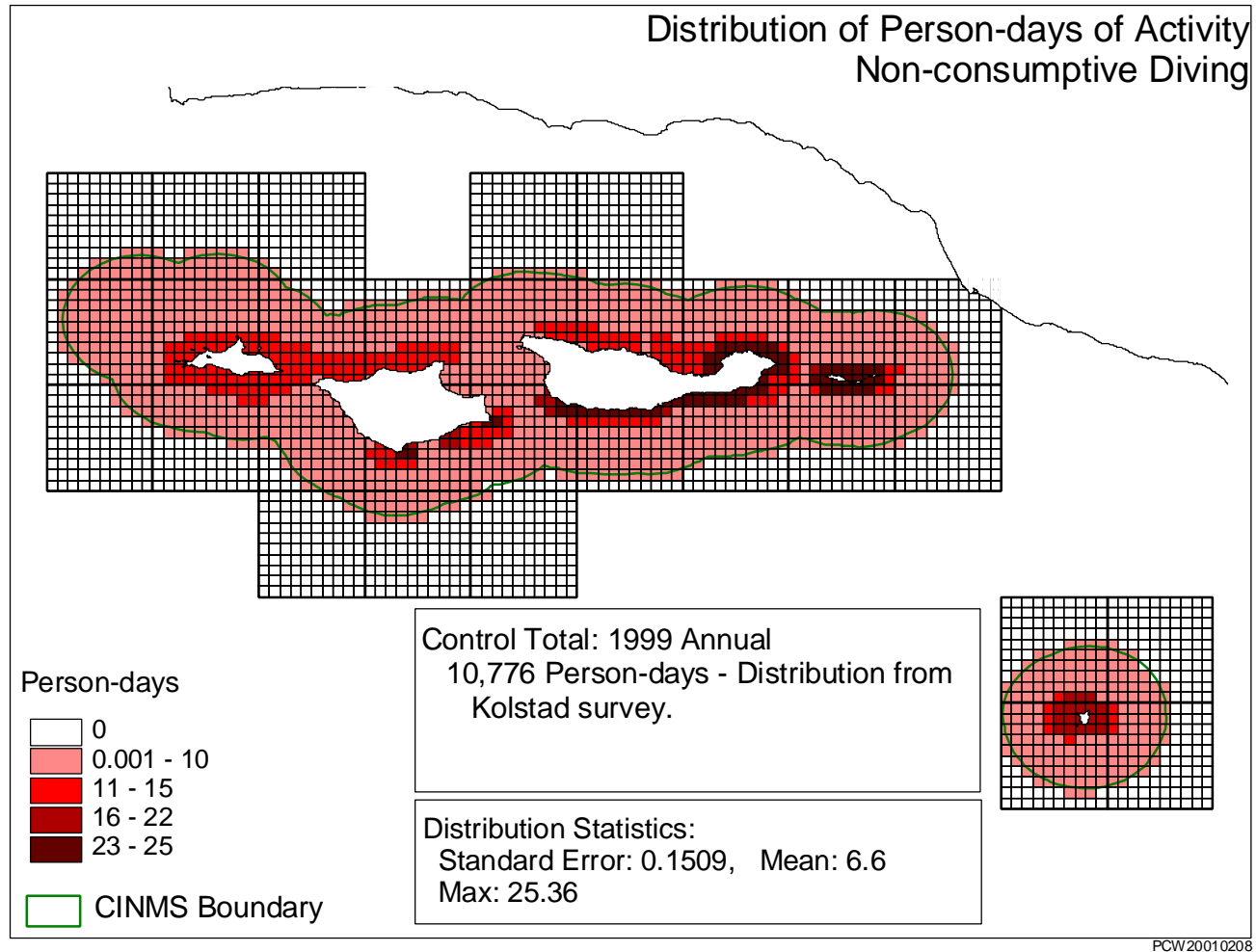
This data was also collected as part of Dr. Kolstad's survey. 4 operators were surveyed for a total of 1,233 person-days of activity in the study area.



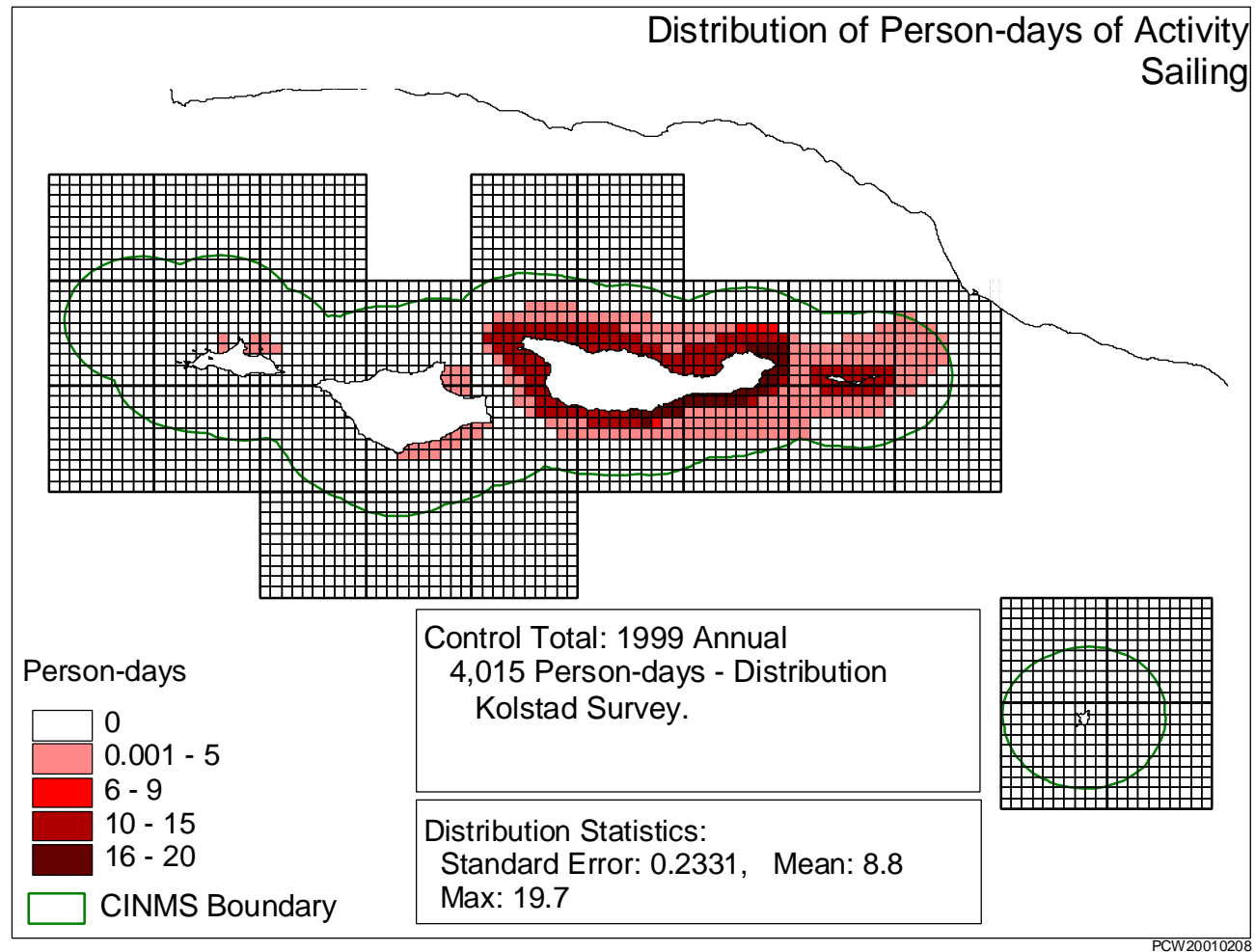
## APPENDIX C



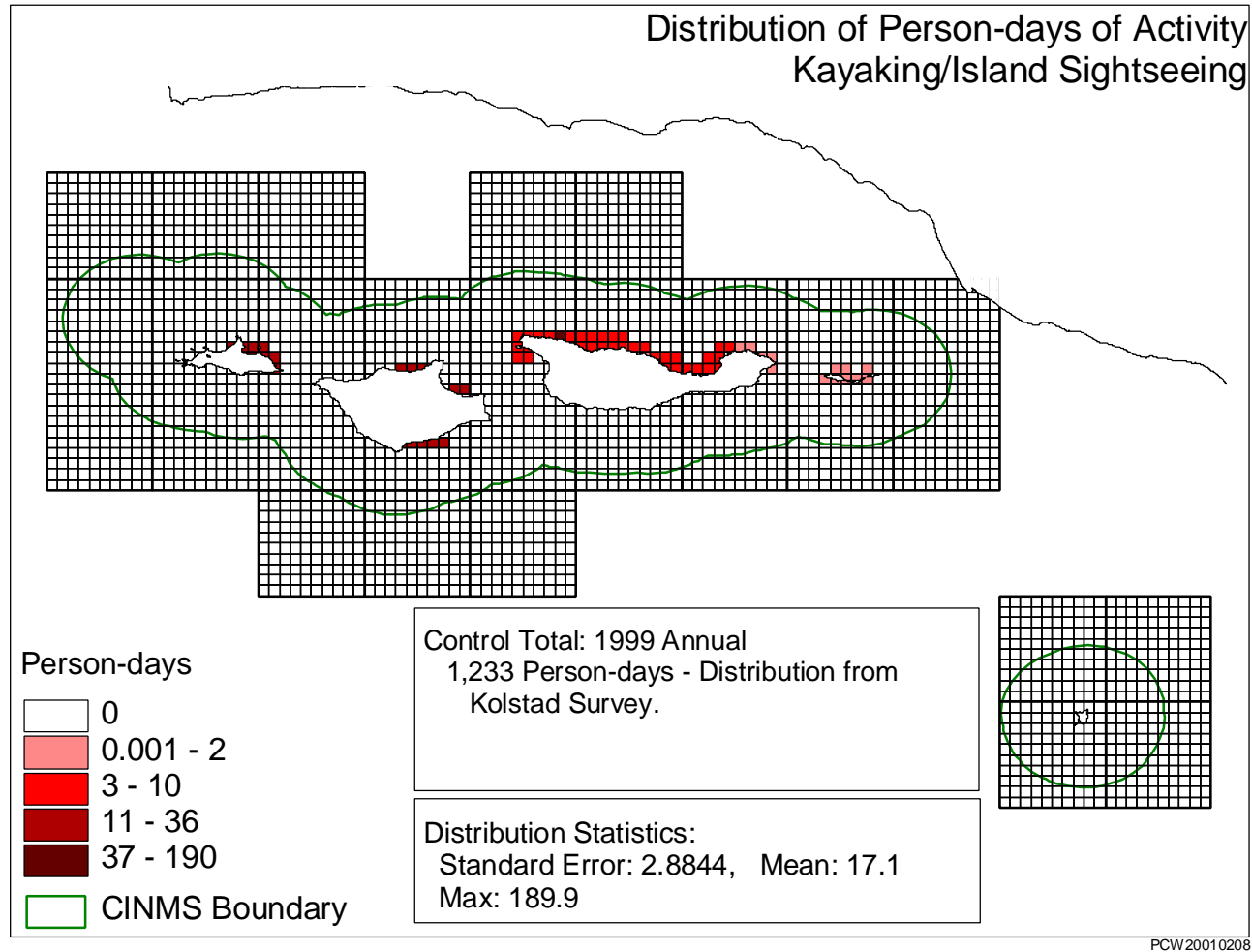
## APPENDIX C



## APPENDIX C



## APPENDIX C



# APPENDIX C

Table A.10.1. Baseline Step 1 Analysis Charter Boat Fishing, Santa Barbara County

Expenditure Category	Expenditure		Wages to		Wages to		Employment
	Per Person	Total Expenditures \$	Sales	Wages & Salary	Employment	Ratio	
Food	15.47	135,471	0.185405925	25,117	11786.88293		2.1
Lodging	8.65	75,748	0.232375514	17,602	14245.93348		1.2
Private Transportation	16.64	145,716	0.170880464	24,900	21624.38212		1.2
Public Transportation	33.07	289,594	0.170880464	49,486	21624.38212		2.3
Boat Fuel	0.00	0	0.056686529	0	12788.05621		0.0
Access/Boat launch Fees	1.18	10,333	0.231621184	2,393	20200.13202		0.1
Equipment Rental	6.01	52,630	0.272281346	14,330	14929.50237		1.0
Bait and Ice	0.52	4,554	0.104264901	475	18232.86584		0.0
Charter Boat fee	60.74	531,939	0.239509323	127,404	12917.92929		9.9
<b>Total</b>	<b>142.28</b>	<b>1,245,985</b>		<b>261,708</b>			<b>17.8</b>
Total Income to				Total Direct Income <sup>1</sup>		Total Direct Employment <sup>2</sup>	
Wages & Salary	2.234846794			584,877		22.4	
Regional Income							
Multiplier				Total Income <sup>3</sup>		Total Employment <sup>4</sup>	
Lower 2.0			Lower	<b>877,315</b>	Lower	<b>28.0</b>	
Upper 2.5			Upper	<b>1,023,534</b>	Upper	<b>33.6</b>	
Proprietors Income to							
Total Income by Work	0.188784335			% County by		% County	
Proprietors Income				Place of Work			0.000%
to Employment	23974.67315			0.014%			
Regional Employment							
Multiplier							
Lower 1.5				% County by			
Upper 2.0				Place of Residence			
				0.008%			

1. Direct wages and salaries is calculated using the following formula:  $\alpha x$  (see below for symbol definitions).
2. Direct employment is calculated by using the following formula:  $(\beta x)/\gamma + y$  (see below for definitions).
3. Total income is calculated by using the following formula:  $X\mu$  (see below for symbol definitions).
4. Total employment is calculated by using the following formula:  $Y\delta$  (see below for symbol definitions).

$\alpha$  = Ratio of total income to wages and salaries.  
 $\beta$  = Ratio of proprietors income to total income by work.  
 $\gamma$  = Ratio of proprietors income to employment.  
 $\mu$  = Regional income multipliers (upper and lower range).  
 $\delta$  = Regional employment multipliers (upper and lower range).  
 $x$ =Wages and salaries  
 $y$ =employment  
 $X$ =Direct wages and salaries  
 $Y$ =Direct Employment

## APPENDIX C

Table A.10.2. Baseline Step 1 Analysis Charter Boat Diving, Santa Barbara County

Expenditure Category	Expenditure Per Person	Total Expenditures \$	Wages to Sales	Wages & Salary	Wages to Employment	Employment
	Per Day \$		Ratio		Ratio	
Lodging	53.00	168,063	0.23237551	39,054	14,246	2.7
Eating & Drinking	29.00	91,959	0.17458227	16,054	11,194	1.4
Transportation	10.00	31,710	0.17088046	5,419	21,624	0.3
Charter Boat fee	40.21	127,500	0.23950932	30,537	12,918	2.4
Miscellaneous	15.00	47,565	0.23162118	11,017	20,200	0.5
<b>Total</b>	<b>147.21</b>	<b>466,797</b>		<b>102,081</b>		<b>7.3</b>
Total Income to				Total Direct Income <sup>1</sup>	Total Direct Employment <sup>2</sup>	
Wages & Salary	2.234846794			228,136		9.1
Regional Income						
Multiplier				Total Income <sup>3</sup>	Total Employment <sup>4</sup>	
Lower 2.0			Lower	<b>342,204</b>	Lower	<b>11.4</b>
Upper 2.5			Upper	<b>399,238</b>	Upper	<b>13.7</b>
Proprietors Income to						
Total Income by Work	0.188784335			% County by	% County	
Proprietors Income				Place of Work		0.000%
to Employment	23974.67315			0.005%		
Regional Employment						
Multiplier						
Lower 1.5				% County by		
Upper 2.0				Place of Residence		
				0.003%		

1. Direct wages and salaries is calculated using the following formula:  $\alpha x$  (see below for symbol definitions).
2. Direct employment is calculated by using the following formula:  $(\beta x)/\gamma + y$  (see below for definitions).
3. Total income is calculated by using the following formula:  $X\mu$  (see below for symbol definitions).
4. Total employment is calculated by using the following formula:  $Y\delta$  (see below for symbol definitions).

$\alpha$  = Ratio of total income to wages and salaries.

$\beta$  = Ratio of proprietors income to total income by work.

$\gamma$  = Ratio of proprietors income to employment.

$\mu$  = Regional income multipliers (upper and lower range).

$\delta$  = Regional employment multipliers (upper and lower range).

$x$ =Wages and salaries

$y$ =employment

$X$ =Direct wages and salaries

$Y$ =Direct Employment

# APPENDIX C

Table A.10.3. Baseline Step 1 Analysis Private Boat Fishing, Santa Barbara County

Expenditure Category	Expenditure Per Person Per Day \$	Total Expenditures \$	Wages to Sales Ratio	Wages & Salary	Wages to Employment Ratio	Employment
Food	7.60	79,329	0.185405925	14,708	11786.88293	1.2
Lodging	1.20	12,526	0.232375514	2,911	14245.93348	0.2
Private Transportation	8.90	92,898	0.170880464	15,874	21624.38212	0.7
Public Transportation	1.89	19,728	0.170880464	3,371	21624.38212	0.2
Boat Fuel	12.74	132,980	0.056686529	7,538	12788.05621	0.6
Access/Boat launch Fees	1.52	15,866	0.231621184	3,675	20200.13202	0.2
Equipment Rental	0.91	9,499	0.272281346	2,586	14929.50237	0.2
Bait and Ice	6.77	70,665	0.104264901	7,368	18232.86584	0.4
Charter Boat fee	0.00	0	0.239509323	0	12917.92929	0.0
<b>Total</b>	<b>41.53</b>	<b>433,490</b>		<b>58,031</b>		<b>3.7</b>
Total Income to				Total Direct Income <sup>1</sup>		Total Direct Employment <sup>2</sup>
Wages & Salary	2.234846794			129,691		4.7
Regional Income						
Multiplier				Total Income <sup>3</sup>		Total Employment <sup>4</sup>
Lower 2.0		Lower		<b>194,537</b>	Lower	<b>5.9</b>
Upper 2.5		Upper		<b>226,960</b>	Upper	<b>7.1</b>
Proprietors Income to						
Total Income by Work	0.188784335			% County by		% County
Proprietors Income				Place of Work		0.000%
to Employment	23974.67315			0.003%		
Regional Employment						
Multiplier						
Lower 1.5				% County by		
Upper 2.0				Place of Residence		
				0.002%		

1. Direct wages and salaries is calculated using the following formula:  $\alpha x$  (see below for symbol definitions).

2. Direct employment is calculated by using the following formula:  $(\beta x)/\gamma + y$  (see below for definitions).

3. Total income is calculated by using the following formula:  $X\mu''$  (see below for symbol definitions).

4. Total employment is calculated by using the following formula:  $Y\delta''$  (see below for symbol definitions).

$\alpha$  = Ratio of total income to wages and salaries.

$\beta$  = Ratio of proprietors income to total income by work.

$\gamma$  = Ratio of proprietors income to employment.

$\mu''$  = Regional income multipliers (upper and lower range).

$\delta''$  = Regional employment multipliers (upper and lower range).

$x$ =Wages and salaries

$y$ =employment

$X$ =Direct wages and salaries

$Y$ =Direct Employment

# APPENDIX C

Table A.10.4. Baseline Step 1 Analysis Private Boat Diving, Santa Barbara County

	Expenditure		Wages to		Wages to		
	Per Person		Sales		Employment		
Expenditure Category	Per Day \$	Total Expenditures \$	Ratio	Wages & Salary	Ratio	Employment	
Boat Gas & Oil	19.00	150,765	0.056686529	8,546	12,788	0.7	
Air Refills	7.00	55,545	0.239509323	13,304	12,918	1.0	
Ice	2.50	19,838	0.104264901	2,068	18,233	0.1	
Boat Ramp Fee	1.50	11,903	0.239509323	2,851	12,918	0.2	
Food & Drink	11.00	87,285	0.174582272	15,238	11,194	1.4	
Auto Gas	9.00	71,415	0.056686529	4,048	12,788	0.3	
Equipment Rental	5.00	39,675	0.272281346	10,803	14,930	0.7	
Total	55.00	436,425		56,858		4.4	
Total Income to				Total Direct Income <sup>1</sup>		Total Direct Employment <sup>2</sup>	
Wages & Salary	2.234846794			127,070		5.4	
Regional Income							
Multiplier				Total Income <sup>3</sup>		Total Employment <sup>4</sup>	
Lower 2.0			Lower	190,605	Lower	6.8	
Upper 2.5			Upper	222,372	Upper	8.2	
Proprietors Income to							
Total Income by Work	0.188784335			% County by	% County		
Proprietors Income				Place of Work	0.000%		
to Employment	23974.67315			0.003%			
Regional Employment							
Multiplier							
Lower 1.5				% County by			
Upper 2.0				Place of Residence			
				0.002%			

1. Direct wages and salaries is calculated using the following formula:  $\alpha x$  (see below for symbol definitions).

2. Direct employment is calculated by using the following formula:  $(\beta x)/\gamma + y$  (see below for definitions).

3. Total income is calculated by using the following formula:  $X\mu''$  (see below for symbol definitions).

4. Total employment is calculated by using the following formula:  $Y\delta''$  (see below for symbol definitions).

$\alpha$  = Ratio of total income to wages and salaries.

$\beta$  = Ratio of proprietors income to total income by work.

$\gamma$  = Ratio of proprietors income to employment.

$\mu''$  = Regional income multipliers (upper and lower range).

$\delta''$  = Regional employment multipliers (upper and lower range).

$x$ =Wages and salaries

$y$ =employment

$X$ =Direct wages and salaries

$Y$ =Direct Employment



# APPENDIX C

Table A.10.5. Baseline Step 1 Analysis Charter/Party Boat Fishing, Ventura County

Expenditure Category	Expenditure Per Person	Total Expenditures \$	Wages to Sales	Wages & Salary	Wages to Employment	Employment
	Per Day \$		Ratio		Ratio	
Food	15.47	2,299,428	0.171537003	394,437	11740.46679	33.6
Lodging	8.65	1,285,718	0.213109652	273,999	14138.05668	19.4
Private Transportation	16.64	2,473,334	0.166580417	412,009	21582.30187	19.1
Public Transportation	33.07	4,915,455	0.166580417	818,818	21582.30187	37.9
Boat Fuel	0.00	0	0.037661501	0	13082.33276	0.0
Access/Boat launch Fees	1.18	175,393	0.197079821	34,566	26686.02901	1.3
Equipment Rental	6.01	893,314	0.24102252	215,309	26205.88235	8.2
Bait and Ice	0.52	77,292	0.105851657	8,181	19902.47277	0.4
Charter Boat fee	47.62	7,078,154	0.229005998	1,620,940	24,860	65.2
<b>Total</b>	<b>129.16</b>	<b>19,198,086</b>		<b>3,778,260</b>		<b>185.1</b>
Total Income to				Total Direct Income <sup>1</sup>		Total Direct Employment <sup>2</sup>
Wages & Salaries	2.338143047			8,834,111		254.3
Regional Income				Total Income <sup>3</sup>		Total Employment <sup>4</sup>
Multiplier						
Lower 2.0			Lower	<b>13,251,167</b>	Lower	<b>317.8</b>
Upper 2.5			Upper	<b>15,459,695</b>	Upper	<b>381.4</b>
Proprietors Income to				% County by		% County
Total Income by Work	0.164550026			Place of Work		0.388%
Proprietors Income						
to Employment	21027.31293			0.127%		
Regional Employment						
Multiplier						
Lower 1.5				% County by		
Upper 2.0				Place of Residence		
				0.072%		

1. Direct wages and salaries is calculated using the following formula:  $x\alpha$  (see below for symbol definitions).
2. Direct employment is calculated by using the following formula:  $(\beta x)/\gamma + y$  (see below for definitions).
3. Total income is calculated by using the following formula:  $X\mu''$  (see below for symbol definitions).
4. Total employment is calculated by using the following formula:  $Y\delta''$  (see below for symbol definitions).

$\alpha$  = Ratio of total income to wages and salaries.

$\beta$  = Ratio of proprietors income to total income by work.

$\gamma$  = Ratio of proprietors income to employment.

$\mu''$  = Regional income multipliers (upper and lower range).

$\delta''$  = Regional employment multipliers (upper and lower range).

$x$ =Wages and salaries

$y$ =employment

$X$ =Direct wages and salaries

$Y$ =Direct Employment

## APPENDIX C

Table A.10.6. Baseline Step 1 Analysis Charter Boat Diving, Ventura County

	Expenditure		Wages to		Wages to	
	Per Person		Sales		Employment	
Expenditure Category	Per Day \$	Total Expenditures \$	Ratio	Wages & Salary	Ratio	Employment
Lodging	53.00	763,147	0.21310965	162,634	14,138	11.5
Eating & Drinking	29.00	417,571	0.16762701	69,996	11,507	6.1
Transportation	10.00	143,990	0.16658042	23,986	21,582	1.1
Charter Boat fee	64.50	928,739	0.229006	212,687	24,860	8.6
Miscellaneous	15.00	215,985	0.19707982	42,566	26,686	1.6
Total	171.50	2,469,432		511,869		28.8
Total Income to				Total Direct Income <sup>1</sup>		Total Direct Employment <sup>2</sup>
Wages & Salary	2.338143047			1,196,823		38.2
Regional Income						
Multiplier				Total Income <sup>3</sup>		Total Employment <sup>4</sup>
Lower 2.0			Lower	1,795,235	Lower	47.8
Upper 2.5			Upper	2,094,441	Upper	57.3
Proprietors Income to						
Total Income by Work	0.164550026			% County by	% County	
Proprietors Income				Place of Work		0.058%
to Employment	21027.31293			0.017%		
Regional Employment						
Multiplier						
Lower 1.5				% County by		
Upper 2.0				Place of Residence		
				0.010%		

1. Direct wages and salaries is calculated using the following formula:  $x\alpha$  (see below for symbol definitions).
2. Direct employment is calculated by using the following formula:  $(\beta x)/\gamma + y$  (see below for definitions).
3. Total income is calculated by using the following formula:  $X\mu''$  (see below for symbol definitions).
4. Total employment is calculated by using the following formula:  $Y\delta''$  (see below for symbol definitions).

$\alpha$  = Ratio of total income to wages and salaries.

$\beta$  = Ratio of proprietors income to total income by work.

$\gamma$  = Ratio of proprietors income to employment.

$\mu''$  = Regional income multipliers (upper and lower range).

$\delta''$  = Regional employment multipliers (upper and lower range).

x=Wages and salaries

y=employment

X=Direct wages and salaries

Y=Direct Employment

# APPENDIX C

Table A.10.7. Baseline Step 1 Analysis Private Boat Fishing, Ventura County

Expenditure Category	Expenditure Per Person Per Day \$	Total Expenditures \$	Wages to Sales Ratio	Wages & Salary	Wages to Employment Ratio	Employment
Food	7.60	1,463,517	0.171537003	251,047	11740.46679	21.4
Lodging	1.20	231,082	0.213109652	49,246	14138.05668	3.5
Private Transportation	8.90	1,713,855	0.166580417	285,495	21582.30187	13.2
Public Transportation	1.89	363,954	0.166580417	60,628	21582.30187	2.8
Boat Fuel	12.74	2,453,316	0.037661501	92,396	13082.33276	7.1
Access/Boat launch Fees	1.52	292,703	0.197079821	57,686	26686.02901	2.2
Equipment Rental	0.91	175,237	0.24102252	42,236	26205.88235	1.6
Bait and Ice	6.77	1,303,685	0.105851657	137,997	19902.47277	6.9
Charter Boat fee	0.00	0	0.229005998	0	24,860	0.0
<b>Total</b>	<b>41.53</b>	<b>7,997,349</b>		<b>976,730</b>		<b>58.7</b>
Total Income to				Total Direct Income <sup>1</sup>		Total Direct Employment <sup>2</sup>
Wages & Salary	2.338143047			2,283,735		76.5
Regional Income						
Multiplier				Total Income <sup>3</sup>		Total Employment <sup>4</sup>
Lower 2.0			Lower	<b>3,425,602</b>	Lower	<b>95.7</b>
Upper 2.5			Upper	<b>3,996,535</b>	Upper	<b>114.8</b>
Proprietors Income to				% County by		% County
Total Income by Work	0.164550026			Place of Work		0.117%
Proprietors Income						
to Employment	21027.31293			0.033%		
Regional Employment						
Multiplier				% County by		
Lower 1.5				Place of Residence		
Upper 2.0				0.019%		

1. Direct wages and salaries is calculated using the following formula:  $\alpha x$  (see below for symbol definitions).
2. Direct employment is calculated by using the following formula:  $(\beta x)/\gamma + y$  (see below for definitions).
3. Total income is calculated by using the following formula:  $X\mu''$  (see below for symbol definitions).
4. Total employment is calculated by using the following formula:  $Y\delta''$  (see below for symbol definitions).

$\alpha$  = Ratio of total income to wages and salaries.

$\beta$  = Ratio of proprietors income to total income by work.

$\gamma$  = Ratio of proprietors income to employment.

$\mu''$  = Regional income multipliers (upper and lower range).

$\delta''$  = Regional employment multipliers (upper and lower range).

x=Wages and salaries

y=employment

X=Direct wages and salaries

Y=Direct Employment

# APPENDIX C

Table A.10.8. Baseline Step 1 Analysis Private Boat Diving, Ventura County

Expenditure Category	Expenditure Per Person Per Day \$	Total Expenditures \$	Wages to Sales Ratio	Wages & Salary	Wages to Employment Ratio	Employment
Boat Gas & Oil	19.00	646,969	0.037661501	24,366	13,082	1.9
Air Refills	7.00	238,357	0.229005998	54,585	24,860	2.2
Ice	2.50	85,128	0.105851657	9,011	19,902	0.5
Boat Ramp Fee	1.50	51,077	0.229005998	11,697	24,860	0.5
Food & Drink	11.00	374,561	0.167627006	62,787	11,507	5.5
Auto Gas	9.00	306,459	0.037661501	11,542	13,082	0.9
Equipment Rental	5.00	170,255	0.24102252	41,035	26,206	1.6
<b>Total</b>	<b>55.00</b>	<b>1,872,805</b>		<b>215,022</b>		<b>12.9</b>
Total Income to Wages & Salary	2.338143047			Total Direct Income <sup>1</sup> 502,753		Total Direct Employment <sup>2</sup> 16.8
Regional Income Multiplier				Total Income <sup>3</sup>		Total Employment <sup>4</sup>
Lower 2.0			Lower	<b>754,129</b>	Lower	<b>21.0</b>
Upper 2.5			Upper	<b>879,817</b>	Upper	<b>25.2</b>
Proprietors Income to Total Income by Work	0.164550026			% County by Place of Work	% County	
Proprietors Income to Employment	21027.31293			0.007%		0.026%
Regional Employment Multiplier				% County by Place of Residence		
Lower 1.5						
Upper 2.0						
				0.004%		

1. Direct wages and salaries is calculated using the following formula:  $\alpha x$  (see below for symbol definitions).

2. Direct employment is calculated by using the following formula:  $(\beta x)/\gamma + y$  (see below for definitions).

3. Total income is calculated by using the following formula:  $X\mu''$  (see below for symbol definitions).

4. Total employment is calculated by using the following formula:  $Y\delta''$  (see below for symbol definitions).

$\alpha$  = Ratio of total income to wages and salaries.

$\beta$  = Ratio of proprietors income to total income by work.

$\gamma$  = Ratio of proprietors income to employment.

$\mu''$  = Regional income multipliers (upper and lower range).

$\delta''$  = Regional employment multipliers (upper and lower range).

x=Wages and salaries

y=employment

X=Direct wages and salaries

Y=Direct Employment

# APPENDIX C

Table A.10.9. Baseline Step 1 Analysis Charter Boat Fishing, Los Angeles County

Expenditure Category	Expenditure Per Person	Total Expenditures \$	Wages to Sales	Wages & Salary	Wages to Employment	Employment
	Per Day \$		Ratio		Ratio	
Food	15.47	21,249	0.175118965	3,721	12848.82845	0.3
Lodging	8.65	11,881	0.20181569	2,398	16112.61061	0.1
Private Transportation	16.64	22,856	0.119408566	2,729	19952.00329	0.1
Public Transportation	33.07	45,423	0.119408566	5,424	19952.00329	0.3
Boat Fuel	0.00	0	0.039248605	0	13772.40377	0.0
Access/Boat launch Fees	1.18	1,621	0.268261264	435	29734.05276	0.0
Equipment Rental	6.01	8,255	0.243828383	2,013	19544.97354	0.1
Bait and Ice	0.52	714	0.103146649	74	19023.1563	0.0
Charter Boat fee	59.95	82,337	0.205539552	16,924	28,630	0.6
<b>Total</b>	<b>141.49</b>	<b>194,335</b>		<b>33,717</b>		<b>1.6</b>
Total Income to				Total Direct Income <sup>1</sup>		Total Direct Employment <sup>2</sup>
Wages & Salary	1.662507805			56,054		1.9
Regional Income						
Multiplier				Total Income <sup>3</sup>		Total Employment <sup>4</sup>
Lower 2.0		Lower		<b>84,081</b>	Lower	<b>2.3</b>
Upper 2.5		Upper		<b>98,095</b>	Upper	<b>2.8</b>
Proprietors Income to						
Total Income by Work	0.144206695			% County by		% County
Proprietors Income				Place of Work		0.00000024%
to Employment	26601.36574			0.000048%		
Regional Employment						
Multiplier						
Lower 1.5				% County by		
Upper 2.0				Place of Residence		
				0.000037%		

1. Direct wages and salaries is calculated using the following formula:  $\alpha x$  (see below for symbol definitions).
2. Direct employment takes into account proprietors employment by using the following formula:  $(\beta x)/\gamma + y$  (see below for symbol definitions).
3. Total income is calculated by using the following formula:  $X\mu$  (see below for symbol definitions).
4. Total employment is calculated by using the following formula:  $Y\delta$  (see below for symbol definitions).

$\alpha$  = Ratio of total income to wages and salaries.

$\beta$  = Ratio of proprietors income to total income by work.

$\gamma$  = Ratio of proprietors income to employment.

$\mu$  = Regional income multipliers (upper and lower range).

$\delta$  = Regional employment multipliers (upper and lower range).

x=Wages and salaries

y=employment

X=Direct wages and salaries

Y=Direct Employment

## APPENDIX C

Table A.10.10. Baseline Step 1 Analysis Charter Boat Diving, Los Angeles County

Expenditure Category	Expenditure	Total Expenditures \$	Wages to	Wages & Salary	Wages to	Employment
	Per Person		Sales		Employment	
	Per Day \$		Ratio		Ratio	
Lodging	53.00	19,269	0.20181569	3,889	16,113	0.2
Eating & Drinking	29.00	10,543	0.17046229	1,797	12,333	0.1
Transportation	10.00	3,636	0.11940857	434	19,952	0.0
Charter Boat fee	92.56	33,652	0.20553955	6,917	28,630	0.2
Miscellaneous	15.00	5,453	0.26826126	1,463	29,734	0.0
Total	199.56	72,553		14,500		0.7
Total Income to				Total Direct Income <sup>1</sup>		Total Direct Employment <sup>2</sup>
Wages & Salary	1.662507805			24,106		0.8
Regional Income				Total Income <sup>3</sup>		Total Employment <sup>4</sup>
Multiplier						
Lower 2.0			Lower	36,159	Lower	1.0
Upper 2.5			Upper	42,186	Upper	1.2
Proprietors Income to						
Total Income by Work	0.144206695			% County by	% County	
Proprietors Income				Place of Work		0.00000011%
to Employment	26601.36574			0.000020%		
Regional Employment						
Multiplier						
Lower 1.5				% County by		
Upper 2.0				Place of Residence		
				0.000016%		

1. Direct wages and salaries is calculated using the following formula:  $\alpha x$  (see below for symbol definitions).
2. Direct employment takes into account proprietors employment by using the following formula:  $(\beta x)/\gamma + y$  (see below for symbol definitions).
3. Total income is calculated by using the following formula:  $X\mu''$  (see below for symbol definitions).
4. Total employment is calculated by using the following formula:  $Y\delta''$  (see below for symbol definitions).

$\alpha$  = Ratio of total income to wages and salaries.

$\beta$  = Ratio of proprietors income to total income by work.

$\gamma$  = Ratio of proprietors income to employment.

$\mu''$  = Regional income multipliers (upper and lower range).

$\delta''$  = Regional employment multipliers (upper and lower range).

$x$ =Wages and salaries

$y$ =employment

$X$ =Direct wages and salaries

$Y$ =Direct Employment

# APPENDIX C

Table A.10.11. Baseline Step 1 Analysis Private Boat Fishing, Los Angeles County

Expenditure Category	Expenditure Per Person Per Day \$	Total Expenditures \$	Wages to Sales Ratio	Wages & Salary	Wages to Employment Ratio	Employment
Food	7.60	83,668	0.175118965	14,652	12848.82845	1.1
Lodging	1.20	13,211	0.20181569	2,666	16112.61061	0.2
Private Transportation	8.90	97,980	0.119408566	11,700	19952.00329	0.6
Public Transportation	1.89	20,807	0.119408566	2,485	19952.00329	0.1
Boat Fuel	12.74	140,255	0.039248605	5,505	13772.40377	0.4
Access/Boat launch Fees	1.52	16,734	0.268261264	4,489	29734.05276	0.2
Equipment Rental	0.91	10,018	0.243828383	2,443	19544.97354	0.1
Bait and Ice	6.77	74,531	0.103146649	7,688	19023.1563	0.4
Charter Boat fee	0.00	0	0.205539552	0	28,630	0.0
<b>Total</b>	<b>41.53</b>	<b>457,204</b>		<b>51,626</b>		<b>3.1</b>
Total Income to Wages & Salary	1.662507805			Total Direct Income <sup>1</sup> 85,829	Total Direct Employment <sup>2</sup>	3.6
Regional Income Multiplier				Total Income <sup>3</sup>	Total Employment <sup>4</sup>	
Lower 2.0		Lower		<b>128,744</b> Lower		<b>4.5</b>
Upper 2.5		Upper		<b>150,201</b> Upper		<b>5.3</b>
Proprietors Income to Total Income by Work	0.144206695			% County by Place of Work	% County	0.0000005%
Proprietors Income to Employment	26601.36574			0.00007%		
Regional Employment Multiplier				% County by Place of Residence		
Lower 1.5				0.00006%		
Upper 2.0						

1. Direct wages and salaries is calculated using the following formula:  $xx$  (see below for symbol definitions).
2. Direct employment takes into account proprietors employment by using the following formula:  $(\beta x)/\gamma + y$  (see below for symbol definitions).
3. Total income is calculated by using the following formula:  $X\mu''$  (see below for symbol definitions).
4. Total employment is calculated by using the following formula:  $Y\delta''$  (see below for symbol definitions).

$\alpha$  = Ratio of total income to wages and salaries.

$\beta$  = Ratio of proprietors income to total income by work.

$\gamma$  = Ratio of proprietors income to employment.

$\mu''$  = Regional income multipliers (upper and lower range).

$\delta''$  = Regional employment multipliers (upper and lower range).

$x$ =Wages and salaries

$y$ =employment

$X$ =Direct wages and salaries

$Y$ =Direct Employment

# APPENDIX C

Table A.10.12. Baseline Step 1 Analysis Private Boat Diving, Los Angeles County

Expenditure Category	Expenditure	Total Expenditures \$	Wages to	Wages & Salary	Wages to	Employment
	Per Person Per Day \$		Sales Ratio		Employment Ratio	
Boat Gas & Oil	19.00	98,876	0.039248605	3,881	13,772	0.3
Air Refills	7.00	36,428	0.205539552	7,487	28,630	0.3
Ice	2.50	13,010	0.103146649	1,342	19,023	0.1
Boat Ramp Fee	1.50	7,806	0.205539552	1,604	28,630	0.1
Food & Drink	11.00	57,244	0.170462286	9,758	12,333	0.8
Auto Gas	9.00	46,836	0.039248605	1,838	13,772	0.1
Equipment Rental	5.00	26,020	0.243828383	6,344	19,545	0.3
Total	55.00	<b>286,220</b>		<b>32,255</b>		<b>1.9</b>
Total Income to Wages & Salary	1.662507805			Total Direct Income <sup>1</sup> 53,624		Total Direct Employment <sup>2</sup> 2.2
Regional Income Multiplier				Total Income <sup>3</sup>		Total Employment <sup>4</sup>
Lower 2.0			Lower	<b>80,437</b>	Lower	<b>2.8</b>
Upper 2.5			Upper	<b>93,843</b>	Upper	<b>3.3</b>
Proprietors Income to Total Income by Work	0.144206695			% County by Place of Work		% County 0.00000029%
Proprietors Income to Employment	26601.36574			0.00005%		
Regional Employment Multiplier						
Lower 1.5				% County by Place of Residence		
Upper 2.0				0.00004%		

1. Direct wages and salaries is calculated using the following formula:  $\alpha x$  (see below for symbol definitions).
2. Direct employment takes into account proprietors employment by using the following formula:  $(\beta x)/\gamma + y$  (see below for symbol definitions).
3. Total income is calculated by using the following formula:  $X\mu''$  (see below for symbol definitions).
4. Total employment is calculated by using the following formula:  $Y\delta''$  (see below for symbol definitions).

$\alpha$  = Ratio of total income to wages and salaries.

$\beta$  = Ratio of proprietors income to total income by work.

$\gamma$  = Ratio of proprietors income to employment.

$\mu''$  = Regional income multipliers (upper and lower range).

$\delta''$  = Regional employment multipliers (upper and lower range).

$x$ =Wages and salaries

$y$ =employment

$X$ =Direct wages and salaries

$Y$ =Direct Employment